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CHRONIC MOUTH INFECTIONS IN THEIR RELATION TO GENERAL DISEASES: A SYMPOSIUM

THE PREVALENCE OF CHRONIC MOUTH INFECTIONS AND THEIR MANAGEMENT *

FREDERICK B. MOOREHEAD, M.D.

CHICAGO

An examination of the histories of 498 cases of chronic arthritis in the service of Dr. Frank Billings at the Presbyterian Hospital, Chicago, furnishes valuable information on the incidence of chronic mouth infections. Of this number 332 had careful Roentgen-ray mouth examinations; 1,132 periapical infections ranging from small areas of rarefaction to gross bone lesions were recorded; 994 of the teeth involved had been treated, with varying degrees of root-canal fillings, and 138 teeth showed no evidence of root-canal treatment. The percentage of patients in this group showing definite Roentgen-ray evidence of chronic alveolar abscess was 89; 1,342 teeth were involved in varying degrees of pyorrhea, the diagnosis being based largely on the Roentgen-ray evidence of peridental membrane destruction. Seventy-six per cent. of the patients showed well defined pyorrhea, many of them well advanced with marked suppuration.

A second group of patients from Dr. Billings' service, seventy in number, excluding all arthritics, showed chronic alveolar abscess in 74 per cent. The list included myositis, neuritis, goiter, asthma, nephritis, etc. Forty-nine per cent. had pyorrhea. A third group taken from 150 private office records showed chronic alveolar abscess in 69 per cent.

In determining the incidence of chronic alveolar abscess in patients suffering from chronic disease, one should limit his investigations to adults. Other foci of infection are more likely to be responsible for chronic disease in young people in whom the tonsil undoubtedly is more often responsible than the teeth.

While pulpless teeth are met with in young people, the percentage is quite low compared to those of middle life. This is more largely true of pyorrhea than chronic alveolar abscess. Pyorrhea before twenty-five years of age is comparatively rare. The danger both from chronic alveolar abscess and pyorrhea decreases with advancing age, and the loss of teeth. One may regard, therefore, the period from 25 to 60 as the period of greatest danger.

An edentulous jaw or partially edentulous jaw, where the remaining teeth are free from infection, does not absolve the mouth from responsibility. The removal of part or all of the teeth involved in a chronic infection may serve to clean up the mouth of a patient whose tissues elsewhere have suffered permanent harm, and without effecting a cure. The fact that a mouth at the time of examination may be free from infection does not exclude such a mouth from responsibility any more than the removal of infected teeth insures the repair of permanently damaged joints or other structures.

Such an argument, however, does not absolve one from the responsibility of removing infection whenever it is discovered, whether in recent or long standing cases. The 718 cases cited illustrate the incidence of chronic mouth infection in three groups of cases. The first group of 498 cases were all chronic arthritics. The second group of seventy were chronic infections, none of them suffering from joint lesions. The third group of 150 were office cases, referred for mouth examination because of some systemic disease.

In the first group 89 per cent. had alveolar abscess; the second group 74 per cent., the third group 69 per cent.

The appearance of 89 per cent. of chronic alveolar abscess in so large a group of hospital patients is probably more than presumptive clinical evidence, particularly when viewed in the light of results following treatment and animal experimentation.

In the light of our present knowledge these facts must constitute an eloquent predication. An interesting feature of our study of the frequency of chronic mouth infections was the discovery that the poorer classes had relatively fewer chronic abscesses than the middle and well-to-do classes. The reason is not difficult to find—the poor people, including foreigners, usually have aching teeth treated by early extraction.

Considering the manner of infection, chronic alveolar abscess may be classified as primary and secondary: primary, those in which infection occurs through the root canal from an infected pulp; from faulty technic in root canal treatment; from a failure to adequately seal the root canal and pulp chamber in the introduction of permanent filling materials. Those infections classed as secondary are blood borne, the predisposing cause being a lowered resistance in the periapical tissue brought about, first, by the careless use of arsenic as a devitalizing agent, and, secondly, by the indiscriminate use of irritating agents in the treatment of root canals. The irritation set up in the tissues at the apex of the root results in a stimulation and multiplication of the fixed tissue cells, and

* Chairman's address, read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

the end result is scar tissue, which interferes with normal circulation. The resistance of such areas is relatively low. A periapical infection in a vital tooth can scarcely occur. These secondary infections may be largely represented by the principle of asepsis rather than antisepsis. More good and less harm is accomplished by surgical cleanliness than by the use of antiseptics and disinfectants.

The relative danger of chronic abscess compared to pyorrhea is difficult to measure. While a closed suppurating cavity is more serious than an open one, the quantity of infection is apt to be very much greater in pyorrhea.

Pyorrhea may be looked on as the lesser of two evils, but not to any degree of tolerance.

TREATMENT

The object of treatment is twofold: first, to save the teeth, and second, to rid the mouth of infection. Whatever form of treatment may be undertaken, nothing short of restoring the tissues to a state of health can be considered satisfactory.

A discussion of the various methods employed in the treatment of pyorrhea would for the present purpose be without profit. No fault can be found with an honest, intelligent effort to save teeth involved in a chronic suppurative pericementitis.

In carefully selected cases in the mouths of patients who are in a state of good health, one may properly undertake the treatment of teeth which are not seriously damaged. Where a large portion of the peridental membrane has been destroyed, no permanent cure need be expected. The process of repair in this class consists in the formation of connective tissue—scar tissue—in which the circulation of blood is very limited and which does not form a biologic union between the cementum and alveolar process. No permanency need be expected of repair of this type.

The fibers of the peridental membrane are attached to the cementum by the cementoblasts. Destroyed by a chronic suppurative pericementitis, the cementoblasts probably do not regenerate to any appreciable extent. The cementoblasts being destroyed, there is no hope of union between the cementum and surrounding tissues, except by scar tissue. There is no continuity of tissue in this type of repair, and reinfection is likely to follow.

Well selected cases in the hands of specially trained men undoubtedly yield gratifying results; but the number of men thus qualified form a small percentage of the dental profession, and a great many people are afflicted with chronic suppurative pericementitis.

Recently emetin has been rather extensively advocated and used in the treatment of this condition on the assumption that the endameba was the essential cause. This has been based on a rather far fetched analogy. No one to our knowledge has demonstrated by animal experiments, or even convincing clinical evidence, that the endameba bears anything more than perhaps a symbiotic relationship to the infection. While we cannot at this time enter into a detailed discussion of the subject, we cannot refrain from expressing the opinion that the use of emetin as an experiment has been a failure.

The treatment of chronic alveolar abscess falls naturally into two groups: (1) conservative, and (2) radical.

The first type saves the tooth, and, theoretically at least, removes the infection. The second type removes the tooth and is the only method which removes infection in all cases. In the first type there is involved the opening of each root canal to its apical foramen, and complete disinfection and filling with a neutral substance which shall seal the canal at the foramen, and shall not be affected by moisture or cause irritation to the surrounding tissue. Theoretically these are the requirements. Practically they are realized in a minor degree.

Allowing for natural conditions and body defenses, probably not more than 25 per cent. of all root canals treated may be considered safe. This statement embraces general practice and does not particularize the few teeth treated by a few specialists.

At present there are not enough dentists to care for the people, and while the poor and ignorant have been automatically excluded in the past, they must now be dealt with, because of our new knowledge of chronic infection, on the same basis as the better classes.

Perhaps not over 10 per cent. of dentists may be considered competent to undertake difficult root canal operations. Surely not over 10 per cent. of the people can afford to pay for the services of a dentist who has acquired high skill in root canal technic. If, then, there are too few dentists to take care of all the people, and all the people must be cared for in the matter of infections, and only 10 per cent. of the dentists may be called on to save teeth involved in chronic infections, and only 10 per cent. can afford the services of a specialist, after discounting the successes of specialists in root canal technic, one is confronted with the practical fact that most of the people are seriously involved.

One may postulate that only certain chronic infections are dangerous; but who shall discriminate and say, "This chronic abscess or pyorrhea is harmless and this one is harmful"? When in doubt and the patient is ill, which shall be sacrificed, the tooth, or a possible opportunity for the patient's recovery? No doubt teeth are being extracted which do not bear a causal relationship to general infection; but it certainly is the lesser of two evils to remove the tooth. In so doing one is at least performing a reasonable service in an attempt to bring back health, and whether a patient is well or ill it is never justifiable to allow any infection to remain anywhere in the body which may be removed with as little loss or discomfort as the extraction of a tooth. The functional value of an infected tooth cannot compensate for the harm it may cause.

Every tooth should be saved which may be made to serve the patient better than an artificial substitute, provided we interpret the quality of service in the light of the health and comfort of the patient. Conservative dentistry is strongly urged when its objective is general physical well-being. Saving teeth which perpetuate chronic infection is not conservative dentistry, but destructive dentistry. The chief object of dentistry must always be the maintenance of health. The teeth must not be looked on as independent structures but as interdependent structures. Viewed as tissues intimately associated with health and disease, the teeth and their adnexa cannot be dealt with in the abstract. One may undertake conservative measures in the mouths of patients who are in good health and whose general body defenses are good. Such cases, however, must be checked up and not dismissed until the teeth in question are either free from

infection, or, in case of failure of treatment, have been removed. While at a given time a patient may be in a state of health, one may not presume on good health, and permit conditions to exist which he would not permit in the mouths of those in a state of ill health.

Because of general serious conditions one feels obliged to extract teeth which might be saved if the health of the patient would justify the necessary time for treatment. Teeth may always be extracted, and every reasonable effort should be made to save them when local conditions indicate that they may be saved, and the patient's interests are in no way jeopardized by the process.

While the Roentgen ray is relative, not absolute, we are dependent on it for our estimate of tissue loss both in chronic suppurative pericementitis and chronic abscess. The interpretation of Roentgen-ray films is a fine art, but no amount of experience will save one from occasional surprises and disappointments. A large granuloma, for example, may involve only the spongiosum, and where the external and internal bony plates are thick and dense, the Roentgen ray will not define the area.

To differentiate between an active infection and a rarefied area which has been disinfected and is undergoing repair is difficult or even impossible, especially in a dense field.

The relation of tooth roots to rarefied areas may quite obscure a lesion where the exposure has been made from only one angle. Even though unsatisfactory at times, the Roentgen ray is an indispensable factor in the diagnosis of bone lesions associated with the teeth, and the percentage of failures or mistakes in diagnosis is relatively small.

The very fact that clinical experience demonstrates occasional positive and negative errors only serves to make one careful not to overlook the danger of doubtful cases. The apparent size of a diseased area bears no relation whatever to its possible danger. Chronic infections are dangerous because of quality, not quantity. When conservative treatment is undertaken, the Roentgen ray should be used, first to demonstrate successful root-canal fillings, and second, to check up on the process of repair. Partially healed foci must be looked on with suspicion. Residual infection, though limited in extent, following either therapeutic or surgical measures, may be quite as dangerous as before treatment. No dependence whatever may be placed on subjective symptoms. Through active therapeutic measures a chronic alveolar abscess with a discharging sinus may quiet down, the sinus close, and the overlying tissue become normal. From clinical evidence alone such cases have been classed as cured. In the absence of a roentgenogram no definition of repair can be made. Frequently these cases do not heal, and are much more serious than before treatment, the treatment rarely serving to convert an open infection into a closed one.

SUMMARY

1. The incidence of chronic mouth lesions in a group of over 700 carefully analyzed cases, showing percentages ranging from 69 to 89 per cent., must be looked on as more or less serious evidence.

2. The overwhelming majority of chronic abscesses being associated with previously treated root canals serves to emphasize the importance of root-canal technic.

3. Both in diagnosis and in determining the extent of tissues lost, the Roentgen ray is paramount.

4. The involvement of the peridental membrane is the crux in deciding between conservative and radical treatment.

5. Faulty root-canal technic, the careless use of arsenic as a devitalizing agent, and irritating drugs in the treatment of root canals are strong predisposing factors of chronic alveolar abscess.

6. In carefully selected cases, conservative measures should be employed both in the treatment of chronic abscess and chronic suppurative pericementitis.

7. Where root canals have been disinfected and filled, portions of roots resected, etc., the process of repair should be checked up by roentgenograms made at frequent intervals.

8. Regardless of whatever form of treatment may be employed, the removal of infection is imperative in all cases, whether the patient at the time may be well or ill.

Where the health, comfort and usefulness of a patient are to be weighed over against a tooth, or even all the teeth, the greater interests of the patient must be preserved.

122 South Michigan Avenue.

THE PRINCIPLES INVOLVED IN FOCAL INFECTION AS RELATED TO SYSTEMIC DISEASE*

FRANK BILLINGS, M.D.
CHICAGO

We understand that an infectious disease is a condition due to the invasion of pathogenic micro-organisms, which are capable of multiplication within the tissues of the host.

The principles of infection, both local and general, may be discussed by a consideration of three chief factors:

1. The pathogenic micro-organisms and the conditions which modify their virulence and pathogenicity.

2. The host or infected individual and the conditions which modify his susceptibility to infection.

3. The nature and result of the reactions between the infectious agents and the tissues of the host.

THE PATHOGENIC MICRO-ORGANISMS

The pathogenic micro-organisms which may cause infectious diseases are certain fungi, unicellular animal life, the protozoa, and bacteria. We also recognize that certain infectious diseases are caused by a filterable virus of ultramicroscopic size. The subject of this paper will be limited to a discussion of infectious bacteria, with the exception that *Endameba buccalis* will be considered in oral sepsis.

The objects of the paper will be quite as fully attained, too, by limiting the discussion to the usual pathogenic bacteria which cause focal infection, namely, the members of the streptococcus-pneumococcus group, staphylococci, gonococci, colon, diphtheria and tubercle bacilli, certain anaerobes and possibly other micro-organisms. Practically all of these may be found on the skin or mucous membranes, and

* Read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

if the surface is unbroken they may exist as harmless parasites. Apparently healthy individuals may be carriers of the bacilli of influenza and diphtheria and of streptococci, pneumococci and meningococci located on the mucous membrane of the tonsils, pharynx, nose and accessory sinuses. An individual who has had typhoid fever and occasionally one who has never had the disease may be a carrier of typhoid bacilli which may be discharged with the feces and urine. The bacteria named may bear an apparently harmless parasitic relation to the carrier, but if communicated to another individual may excite morbid reactions within the tissues of the new host.

The perpetuation of micro-organisms requires that they be transmitted from time to time to new hosts. That is accomplished by a direct route through the secretions and excretions of the mucous surfaces on which they live as parasites; through the pathologic products which they excite in infected tissues, and indirectly through the blood stream by way of the secretions and excretions. Here we are not concerned with those infectious diseases transmitted by blood-sucking insects. In direct transmission to new hosts the pathologic exudates must communicate with the outside surface, as in furunculosis, tonsillitis, sinusitis, gonorrhea, pyorrhea alveolaris, and bronchitis.

The transmission may be facilitated by direct individual contact, as in kissing and coitus; through approximate contact by inhaling air immediately charged with infected dust, droplets of saliva and sputum; by contact with infected articles, drinking and eating utensils, dental and surgical instruments, clothing, and many other forms of fomites; through infected food, especially milk, and by many other means. The tissues of the new host may be infected, therefore, through the mouth, air passages, skin or genito-urinary apparatus. The infection may be single, as, for example, in gonorrhea, or mixed, as may be seen frequently in diphtheria, with coincident streptococcus infection of the throat. A secondary infection is the invasion of pathogenic bacteria into the tissues previously infected. It is a type of mixed infection. Clinical experience and animal inoculation seem to show that bacterial association in mixed infection tends to increase the virulence of one or all of the species included in the microbic invasion. For example, appendicitis, which in most instances is caused primarily by the hematogenous invasion of bacteria, may become fulminating and rapidly gangrenous through a secondary invasion of the injured tissues by the bacterial flora in the lumen of the appendix, usually colon bacilli and certain anaerobes.

A high degree of virulence of the infectious micro-organisms is liable to destroy the host, and thus directly diminishes the chances of the infectious agents to pass to new hosts. While the susceptibility of the host to a specific infection is an important factor in the result of the microbic invasion, still the laws which govern the perpetuation of pathogenic micro-organisms include adaptation to the conditions, which mean lessened pathogenicity and permit of parasitic existence. The permanency of the perpetuation of a given species will depend on the perfection of its adaption to the environment and the opportunity to pass to other hosts. As susceptible hosts diminish, through increased resistance, the infection becomes milder and mortality less. While the perpetuation of the existence of pathogenic micro-organisms is dependent on the attainment of a condition of parasitism and the opportunity to pass to the new hosts, there is proof that the infectious agents may regain pathogenic powers of a general and even of a special kind. The acquisition of a general or special pathogenicity with varying degrees of virulence may occur in various ways. Some of the species of bacteria under discussion are pathogenic for animals and may exist in the tissues of animals, as in man, as parasites. The bacteria existing as parasites in the animal may be pathogenic in the new host, man.

So too the mildly pathogenic or parasitic species may be communicated by man to a medium outside of the body, on which the bacteria may grow and attain pathogenic qualities and varying degrees of virulence for the host. Dairymen may infect milk with streptococci from their mouths and air passages. Milk is a good culture medium and in it streptococci and other bacteria may attain unusual virulence, and cause severe infection of the mucous membrane of the throat and digestive tract of susceptible persons who drink the unsterilized milk. The micro-organisms which have become parasitic in one human host may become pathogenic when communicated to a new host more susceptible to the species. The bacterial invaders, mildly pathogenic, may become virulent in a host suffering with general debility from any cause, or whose vitality is low or in whom the blood circulation is poor because of exposure to extreme cold or to severe fatigue. The conditions mentioned and other modifying influences may, among other things, affect the oxygen supply of the tissues of the host. The varying quantity of available oxygen in the tissues may be an important factor in determining the immediate or remote development of the micro-organisms in the tissues into harmless parasites or into virulent invaders of local or systemic tissues.

Schottmüller classified streptococci pathogenic for man, by growing them in solid blood-agar medium, into *S. hemolysans* (*longus*), *S. mucosus* and *S. viridans* (*mitior*). We have learned that any one of these types may change in general and special pathogenicity and the degree of virulence. *S. viridans*, so named because of the green colored halo produced by the colonies on blood-agar, is usually of very mild pathogenicity for man. It is a very common surface parasite of the mucous membrane of the mouth and tonsil. Apparently this type of streptococcus may acquire special pathogenicity for the endocardium and especially for old valvular scars and cause enormous vegetations and thrombus formation on the heart valves. A person so affected suffers from a constant viridans streptococcemia. In other instances a green producing streptococcus of less virulence than the foregoing may be isolated from the infected tissues of the patients suffering from myositis, arthritis and other chronic diseases. Evidently the property of green color production on the blood-agar plates only affords a name, but does not signify the pathogenic character or virulence. The type may even lose the property of green color production on culture media.

By varying the character of the culture mediums, *S. hemolysans* may lose the property to hemolyze blood-agar medium. It may possess a hemolyzing property, and at the same time may vary in pathogenic characters. It may be pyogenic; may acquire a special pathogenicity and tropism for subcutaneous tissues, as in erysipelas without suppuration. The ability to hemolyze blood-agar does not necessarily indicate a special or general pathogenicity.

The variation of the members of the streptococcus-pneumococcus group in culture characteristics, biologic quality, in general and special pathogenicity and degree of virulence has been noted by many clinical bacteriologists. We know that these variations may be brought about in the laboratory, by serial animal inoculations and by modifications of the character of the media and the oxygen pressure in bacterial cultures.

Apparently like changes may occur in localized, confined infections, especially those due to the streptococcus-pneumococcus group. Here one may infer that the tissues involved in the focal infection act as a culture medium. The tissue mediums may be modified by variations in blood supply, consequently in oxygen tension, or unknown biochemic or other factors may alter the character of the confined infectious agents. Apparently in no other way may we explain the sudden onset of rheumatism after acute or during chronic tonsillitis; of streptococcus viridans endocarditis associated with alveolar abscess, and many other systemic infections, undoubtedly etiologically related to an existing chronic, localized and confined infection.

THE HOST AND THE CONDITIONS WHICH MODIFY HIS SUSCEPTIBILITY TO INFECTION

Man possesses a natural immunity to infection, but it is never absolute. The facility of infection of the person and the opportunity for the pathogenic micro-organisms to perpetuate themselves, depends in some degree on the characteristics of the infectious agents, as we have seen, but also on conditions peculiar to the host.

The age, environment, social condition, occupation, habits, domiciliary and occupational environment, climate, physical well-being are important factors in determining the susceptibility of the host to infection. It is not necessary to consider all of these factors, but a detailed discussion of some of them is important in the attempt to establish a clear idea of the principles involved.

The individual host must be considered first, because he becomes a carrier of infection the more readily in proportion to the lack of personal cleanliness, in the habitual overuse of alcohol and habit forming drugs, the practice of sexual immorality and other debility-producing habits. By contact with his fellow men in dwelling, workshop, and public conveyances and public congregations, he readily communicates the infectious parasites of which he is a carrier to others. The new hosts are more or less susceptible, dependent on the conditions which make for good or for bad defense, already mentioned. The facility of communication of the infection from host to host will be necessarily modified by the density of the population, by the hygenic conditions of the home, the workshop, the vehicles of transit, by the general conditions dependent on municipal control of the cleanliness of the streets, the water and the food supply and on the adequacy of the sewage disposal.

The person is also important as a host, in regard to the susceptibility to infection due to the modifying influence of age, occupation and the existing physical and mental conditions. The child is comparatively more susceptible to the contagious diseases. The lymphoid tissues of the child are relatively excessive, especially in the structures of the nose and pharynx. Therefore children suffer frequently with tonsillitis, coryza, sinusitis, otitis media and mastoiditis, both acute and chronic. The regional cervical lymph nodes may be secondarily infected from the foci named, and while the lymphadenitis may prevent immediate general infection, the infected glands may serve, sooner or later, as additional sources of systemic infection. The debility of old age, with the associated poor blood circulation, relatively low tissue nutrition and faulty metabolism, increases the susceptibility to infection and facilitates parasitism. Diseases due to faulty metabolism, like diabetes mellitus and gout, invite and prolong infection.

Exhausting chronic infectious diseases, like pulmonary tuberculosis, are frequently associated with secondary infection of pyogenic bacteria. The mixed infection promotes the virulence of one or all of the invading pathogenic micro-organisms with consequent harm to the host. Occupations which entail exposure to excessive fatigue, extremes of heat and cold and to air contaminated with mechanical and chemical irritants are important factors in the production of local and general infection.

THE NATURE AND RESULT OF THE REACTIONS BETWEEN THE INFECTIOUS MICRO-ORGANISMS AND THE TISSUES OF THE HOST

The entrance of pathogenic micro-organisms into the body of a susceptible host is characterized by local or general reaction between the invading parasites and the tissues of the host. Dependent on the virulence and genus of the invaders, the reaction in the tissues may result in exudates which may be serous, fibrinous, purulent diphtheritic, hemorrhagic, necrotic or proliferative. Local fibrinous and purulent exudates are apparent efforts of the tissues of the host to concentrate protective substances and physical barriers about the invading parasites to prevent extension of further infection. The walled-off infection may remain localized, the infectious parasites, adjusting themselves to a parasitic existence or local infection, may disappear under the influences of the defensive and offensive powers of the tissues, aided by medicinal or surgical management. On the other hand, the local infection may be coincident with general systemic infection or general infection may occur at some indefinite time subsequent to the local tissue invasion.

Systemic invasion from a local infection may be by way of the blood or lymph stream. The hematogenous route is undoubtedly the usual one. Practically always the regional lymph nodes are secondarily invaded from the primary local tissue infection. The lymph node infection may be subsequently a source of systemic infection by the hematogenous route. On the other hand the secondarily infected lymph nodes may be the place of destruction of the invaders.

The reactions of the systemic tissues hematogenously infected are essentially the same as those mentioned under the local reactions of the tissues; that is the production of serous, fibrinous, purulent, hemorrhagic or other inflammatory conditions. As already pointed out, these reactions are in the nature of defensive or offensive measures on the part of the tissues of the host to destroy the invading bacteria. The infectious micro-organisms also promote the formation within the tissues of the host of defensive and offensive substances, or antibodies. These substances, in the form of ferments, are apparently mobilized by the reaction between the invading bacteria and the tissues of the host. Immunologists are not in agree-

ment as to the exact factors which enter into the reaction. All are in agreement, that all pathogenic bacteria do not cause the mobilization of a uniform number or of like kind of antibodies. The number and kind of antibodies found in the host in some infectious diseases, like typhoid fever, may overcome the invaders and afford a lifelong immunity to future infection. In other infectious diseases the defensive and offensive forces may overcome the present invasion, but afford no protection, or apparently may increase the susceptibility to future attacks, as in pneumonia and rheumatism.

The result of hematogenous invasion with pathogenic bacteria will be modified by the specific type, the virulence of the bacteria and also by the character of the anatomic structure and specific function of the tissue involved.

The type and virulence will decide the character of the tissue reaction as to the formation of a serous, fibrinous, purulent or other form of exudate. The more virulent the invaders the severer the reaction. The less virulent type will cause serofibrinous exudates. The tissues of the host are disturbed by the reactions, destructive in character (abscess, necrosis, hemorrhage and gangrene) by virulent micro-organisms, and deprived of nutrition and oxygen, more or less, by the proliferation of the endothelium of the arterioles and the serous and fibrinous exudates by the less virulent invaders. The infection of a joint with virulent streptococci or virulent gonococci will cause purulent destructive arthritis. The infection with less virulent streptococci and gonococci will result, usually, in a chronic serous or fibrinous arthritis, with subsequent metabolic degenerative changes due apparently to the poor local nutrition, in consequence of the injury to the blood vessels and tissues of the joint. Very virulent bacteria are apt to cause local tissue destruction or to kill the host. That is, virulent bacteria may be ultimately destroyed by the severe reactions they excite in the tissues of the host.

On the other hand, pathogenic micro-organisms of low virulence, which gain access through the blood stream, excite mild reactions, which, however, lessen the supply of blood and oxygen to the tissues involved. This may create a condition favorable to the perpetuation of the invading bacteria in the tissues of the host. In this tissue medium the bacteria may continue to be pathogenic for an indefinite time or may become purely parasitic without apparent harm to the host. Chronic confined infection or even chronic general infection finds an explanation in the reactions excited in the tissues of the host by pathogenic bacteria of relatively low virulence. The natural anatomic structures of the teeth, dental alveoli, faucial tonsils, accessory nasal sinuses, seminal vesicles, prostate gland, fallopian tubes, gallbladder and other structures favor confined infection. When infected, the resulting morbid anatomic changes in all the tissues named add to the physical conditions which promote focal infection. This is well illustrated in chronic alveolar abscess. The invasion of the dental alveoli with *Endameba buccalis* streptococci and other micro-organisms results in destruction of the peridental membrane and other tissues. The roots of the teeth deprived of periosteum become more or less devitalized and, with other local dead tissues, promote continued and aggravated confined infection. The structure of the faucial tonsils invites and promotes continued infection. An infected accessory nasal sinus does not as readily discharge the pathologic products of inflammation as the normal mucus secretion. The seminal vesicles infected with gonococci may retain them for years of time.

The function of infected specialized tissue will be usually disturbed in ratio to the degree of anatomic injury due to the invading bacteria. Hematogenous infection of the kidney may result in a general glomerulonephritis of a degree of severity entirely to suppress its function; a like infection of less severity may diminish the function, as manifested by the excretion of a scant, bloody albuminous and cast-containing urine. Periodic hematogenous infection of specialized tissues with bacteria of relatively low resistance results in repeated anatomic injury. The repeated injury to the blood vessels and other tissues may be so great finally as to result in malnutrition, and metabolic changes degenerative in character take place. Probably this is the sequence of events in chronic infectious nephritis, arthritis, myositis, pancreatitis and chronic infections of other organs.

The space allotted to this paper will not permit a discussion of the interesting tissue reactions, morbid anatomic changes and altered function which occur in infection of the stomach, subcutaneous tissues, the nerve ganglia, iris, thyroid gland and other specialized tissues.

CONCLUSIONS

The conclusions which may be drawn from this discussion of the principles involved in local and general infection are evident. The laws which govern the perpetuation of pathogenic micro-organisms involve a life of parasitism harmless to the host or of varying degrees of pathogenicity. Apparently any specific type of the bacteria discussed may attain the biochemic qualities which permit them to exist in the host as harmless parasites or as injurious agents possessed of a special or a general pathogenicity of varying virulence. The varying pathogenic qualities, special and general, may be acquired apparently in the host or in the passage from host to host (man or animal), or may be brought about in culture mediums.

Confined infection (focal) seems to be a site in which the infectious agents may attain specific pathogenicity chiefly in the nature of tissue tropism (elective tissue affinity). This special quality is not recognized necessarily by cultural characteristics. The power to hemolyze or to produce green color in blood-agar plates by some members of the streptococcus group does not necessarily indicate specific pathogenicity or degree of virulence. The special or general pathogenicity of the infectious agents of the focal infection, and the susceptibility of the host, measured by many factors cited in the paper, may determine the severity, acute or chronic, the extent, local or general, and the site, election of tissue, of the systemic infection. It is believed that these conclusions have been sustained by clinical observations and bacteriologic research.

122 South Michigan Avenue.

Ages of Carelessness.—Every one knows that few individuals between the ages of 30 and 60 take any constructive forethought for their physical welfare; few carry out any definite plans for regular daily exercise or proper breathing of fresh air. Fewer still have even a fair conception of their own physical make-up or their condition at any particular time; this fact is due likely both to lack of time and to reluctance to face the truth.—C. H. Forsyth.

DENTAL INFECTIONS AND SYSTEMIC DISEASE

TREATMENT AND RESULTS *

ERNEST E. IRONS, M.D.
CHICAGO

From the medical standpoint as well as from the dental, the object of the treatment of infections of the teeth is the conservation, as far as possible, of the structure and the function of the teeth, and the prevention of disabling systemic disease. So far as the physician is concerned the present discussion is in no sense a propaganda to prove anything with respect to the methods of treatment of teeth by the dental profession. It is rather a recital of facts which have come to light in the course of an effort on the part of the physician to understand the cause and mechanism of production of a large group of more or less disabling ailments which for years have baffled him in his efforts to cure them. It is true that there have developed many other angles to the question, but these latter have been largely secondary, and the main problem has been and is now that of relieving patients from their disabilities by as conservative and yet as effective methods as possible. Every new proposal or discovery in medicine, or in any field of human activity, passes through certain phases of reaction on the part of the professions concerned, characterized by incredulity, popularity, abuse, and finally, if found of value, takes its place among recognized procedures.

This has never been better illustrated than in the present discussion of alveolar abscess and its relation to systemic disease. It would appear that the great prevalence of alveolar abscess was until recent years as little suspected by many of the dental profession as by physicians, although the importance of oral sepsis was pointed out years ago by such pioneers as Miller and Hunter. Now that the facts are becoming known, in large part by reason of the perfecting of roentgenographic technic, many readjustments of practice, both dental and medical, are being found necessary. It is the difficulties of these readjustments and not the fault of the demonstration of abscesses, which have led to certain temporary misunderstandings, for the correction of which the only essential is a frank discussion, and then sympathetic team-work between dental surgeon and physician.

In this discussion of the medical aspects of dental infection I shall limit myself more particularly to forms of disease associated with alveolar abscess. The more superficial lesions, such as pyorrhea and gingivitis, probably exert an unfavorable influence on the general health, and conversely, systemic disturbances may furnish the conditions favorable to their development; but as a rule they do not appear to give rise to the metastatic lesions so commonly associated with alveolar abscess. Extensive pyorrhea may result in lateral alveolar abscesses, and possibly give rise to distant metastases, but a study of the medical complications associated with dental disease leads one to the view that infections about the teeth conform to the same principles as do surgical lesions elsewhere, and that it is the closed process which usually gives rise to general infection.

I suppose every dentist will agree that a definite and recognized alveolar abscess should be eradicated, whether it is causing general disease or not. Such a position is in keeping with the best tenets of American dentistry.

It must be recognized also that the final decision as to diagnosis and proposed treatment of a dental lesion should properly lie with the dental surgeon, to whose opinion the physician should defer; but in order that his opinion may be worth having, the dental surgeon must acquire an adequate knowledge of the pathology as well as the mechanical treatment of the dental structures. The sins of omission in this matter have not been confined to the dental profession, however, for physicians have been notoriously remiss in the examination of patients, and have overlooked many sources of disease, including those of the mouth, which now are clearly evident.

The observance of ordinary rules of professional courtesy by the physician, the dentist, and, I might add, the roentgenographer will go far toward making successful team-work possible, but each must make himself professionally worthy to deserve this courtesy, and must be willing to listen to the views of his colleagues.

Before passing to a consideration of the results of treatment from a medical standpoint, I wish to refer to certain misconceptions which have been introduced into the problem.

The startling frequency of alveolar abscess and other extensive dental infection has so impressed many physicians and not a few dentists that they are ready to ascribe all human ailments to disease of the teeth, and to attempt to cure them all by the extraction of teeth without definite proof of incurable dental disease, or even presumptive evidence of the causal relation of the dental infection to the systemic disease.

This extreme and wholly unwarranted position has brought about a reaction, and in some quarters the pendulum has oscillated to the other extreme, at which are found a group of protesters, who are ready to declare that diseases of the teeth have no relation to infections in other parts of the body, and who from their attitude would seem to assume that the presence or absence of alveolar suppurations is a matter of no concern either to dentist or physician. Now looking at the problem for the moment from an impersonal point of view, one can see that neither of these positions can be right, but that the truth lies somewhere between.

Another group of physicians and dentists, enthusiastic, somewhat less radical than those just mentioned, have assumed that in a patient suffering from evident disease, such as arthritis, in whom also an alveolar abscess is found, there is necessarily a direct etiologic relation between the two, and that drainage of the abscess will surely result in cure of the arthritis. It is true that occasionally this is the sequence of events, but it often happens that the alveolar abscess is only one of several areas of chronic infection in the body, and may indeed be coordinate with arthritis, both being secondary to some previously existing infection. The perspective of the enthusiast in any specialty is likely to be narrow, and he does not appreciate the importance of the field of his colleagues.

Examination of the blood to determine the presence of leukocytosis has been proposed as a guide to the dentist in determining whether or not a tooth show-

* Read before the Section on Stomatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

ing doubtful roentgenographic findings should be extracted. The desire of dentists to study patients more thoroughly is laudable, but in this instance the presence or absence of leukocytosis can be of but little value unless all other causes of leukocytosis, such as infections in tonsils, sinuses, the genito-urinary and other organs of the body are first excluded, and since this necessitates a complete medical examination, which is not usually available, the test must therefore be far less reliable in routine dental work than the expert examination of the patient's mouth and roentgenogram by the dentist.

The importance of alveolar abscess as a factor in the production of systemic disease has been already discussed by my predecessors in this symposium. Statistics on this subject have come largely from those who are interested in special lines of inquiry, and the relation of alveolar abscess to systemic disease has been determined by the study of groups of patients selected on account of the presence of some clinically striking lesion, such as arthritis.

An examination of the converse proposition is of some interest from the point of view both of etiology and of treatment. An unselected group of 329 patients in a medical ward in Cook County Hospital was studied and the incidence of all discoverable infectious processes determined and tabulated for each patient. The patients were then classified according to final diagnosis, and the percentage of each type of infection in each disease group calculated. It was possible to obtain roentgenographic studies, most of which were confirmed by consultation with dental surgeons, in 124 of the 329 patients. Careful tabulation showed that the patients submitted to roentgenographic examination were fairly representative of the entire group. In 44 per cent. of the 124 patients alveolar abscesses were found. In the arthritic group 76 per cent. had alveolar abscesses; in the group of nephritis and cardiovascular disease 47 per cent.; other diseases, including pneumonias, respiratory, gastro-intestinal, 23 per cent., or less than one third of the percentage in the arthritic group. Abnormalities in tonsils, as expressed by hypertrophy, were present in 45 per cent. of the arthritic group, in 24 per cent. of the cardiovascular group, and in 19 per cent. of the remainder. Other chronic infections, such as those of sinuses or genito-urinary tract, were found in 21 per cent. of the arthritic, 13 per cent. cardiovascular group, and 11 per cent. of other diseases. Syphilis, either from the history, clinical evidence or Wassermann, was found in 23 per cent. of the arthritic group, 39 per cent. of the cardiovascular group, and 13 per cent. of other diseases.

This group of patients is not entirely comparable to a group coming from a higher economic station in life, but the figures serve to demonstrate the relation of the incidence of infections to other forms of disease within the group.

All arthritis or other metastatic and systemic disease is not due to alveolar abscess or to tonsillar infection, of course, but the preponderance of such lesions in this group suggests that these infections may play an important part in the production of chronic arthritis and similar ailments, and probably of certain types of cardiovascular disease, not only the valvular, but the arteriosclerotic, and also certain forms of nephritis, in which cold and exposure are only part of the determining causes.

In the arthritic group therapeutic measures directed to the removal of infectious processes have been followed by gratifying results, even in a rather unfavorable material. Our readmissions for recurrences of arthritis, which in former years were frequent, some patients returning as many as four times in a season, have been relatively fewer, and usually of patients who for some reason or other could not be submitted to proper surgical attention.

In a series of 100 cases of iritis studied with Dr. E. V. L. Brown we found alveolar abscesses and other closed infections, as revealed by roentgenograms and expert dental consultation, in 36 per cent. of forty-seven private patients and 45 per cent. of fifty-three dispensary patients, and in 18 per cent. of the 100 patients the disease of the eye appeared to be associated with dental infection.

In estimating the results which may be expected from the correction of alveolar abscess in any given case it is evident that the presence and influence of other infectious foci must be considered, and neither too great credit for success nor too great censure for failure should be imposed on the dental surgeon who deals with only one of the possible factors in the larger general problem of recovery of the patient. Nor can we always promise prompt cure, even in those patients whose illness clearly originated in dental infection, for after the apparent immediate source of infection is removed, there often remain the mechanical injuries of joints and eyes, or other tissues may have become secondary foci of infection, and recovery is a question of measures which shall build up the resistance of the patient by improving his general nutrition.

VACCINES

The question of the use of vaccines has vexed the physician quite as much as it has the dentist. Active immunization by the injection of specific vaccines has proved of enormous value in the prevention of certain diseases, such as typhoid fever, but the results of the use of vaccines in the treatment of persons already suffering from infections have been in general decidedly disappointing.

There are certain more or less theoretical considerations in regard to the effect of an injection of vaccine on the balance of immunity between invading organism and host in a lesion such as alveolar abscess, but inasmuch as this balance may be deflected as often against as in favor of the host, the theoretical as well as the practical results of vaccine injections as now practiced indicate that their value is extremely doubtful, and that in no case should their use be allowed to replace or hinder the employment of recognized dental and surgical procedures.

Under the most favorable conditions a vaccine could be only an adjunct to other treatment, and in the types of disease we are now discussing, adequate surgical treatment by the dentist usually renders this adjunct superfluous so far as concerns the medical care of the patient. The dentist deals with special types of tissue, but allowing for peculiarities in structure and function of the tissues involved, the same principles of immunity and surgical procedure apply to infections about the teeth as to other organs of the body. When proper surgical measures are carried out by the dentist, the natural resistance of the tissues of the body, including those about the teeth, is usually sufficient to overcome the infecting organism. It would be foolish and futile to attempt to substitute the injection of vaccines for drainage and other well-established methods

of treatment of an alveolar abscess; when proper dental procedures have been carried out, vaccines become unnecessary. The same statement would appear to apply to the treatment of pyorrhea, in which the practice of injecting vaccines, as advised by those commercially interested in their production and sale, has led to absurdities as discreditable to the skill of the dental profession as are similar practices so common in the past among physicians.

SUMMARY

The attitude of the physician in studying his patient should not be that of the prosecuting attorney bent on convicting the teeth of being the cause of all disease, nor should the dentist assume the brief of the defendant, ignoring the evidence of roentgenograms and systemic disease. Both must work in harmony, each believing in the sincerity and good-will of the other, observing professional courtesy and laboring to place the patient in the best physical condition possible.

There seems to be no question that in many cases alveolar abscesses are the source from which invading organisms pass into the circulating blood and produce lesions in joints, eyes, nerves and other structures of the body. It is also true that alveolar abscesses, like tonsillar and other infections, may be latent so far as any marked effect on general health is concerned. Nevertheless, they are potential sources of trouble, and from the medical standpoint, and I believe from the dental, should be eliminated. The recognition of the important relation of alveolar abscess to systemic disease is a great step forward, and the period of extreme neglect of the past will never return. The readjustments in methods of diagnosis and in the establishment of a rational conservatism will come gradually as we learn to appreciate the interdependence of all organs of the body and the community of interest of the dental and medical professions. And this advance in turn calls for better medical education, better dental education.

The difficulties and misunderstandings from which we are now emerging afford one instance among many of the necessity of providing educational facilities which shall produce broad-minded professional men who can appreciate the problems of departments of human medicine other than their own.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. MOOREHEAD, BILLINGS AND IRONS

DR. ROBERT HESSLER, Logansport, Ind.: When I first entered the medical college in 1889 my respiratory mucous membranes reacted acutely; I had profuse coryza and catarrh. At times the secretion was abnormal, and under severe infection there was actual pus. After the formation of scar tissue the mucous membranes reacted less. At present I seldom have a coryza. I have an "open throat"; it is not closed by encroaching hypertrophied tonsils. In the course of years the reaction of the respiratory tract on inhaling infected air became less marked, but the cardiovascular system reacted. Ordinarily, I live under good air conditions on the edge of a small town and my blood pressure is about 100. On inhaling infected dust, as at present, it will run up to 150. My father was a "high pressure case" and died at 40; I am 55. During the last year I noticed a new reaction: After being exposed to bad air, I could readily draw blood from my gums; in the morning it is dark. I can do it now; I tried it a few moments ago. Depending on the amount of infection inhaled or length of exposure, this condition prevails for one or more days, maybe a week, when it fades. Then there may be another exposure, and I can again draw blood. The gums are infected. At such times I also notice more or less arthritic pain, especially in the wrists. It means infection. (My father was subject to general arthritic, "gouty" pains and had an ankylosed left wrist.) As a student of prevalent ill health and causes, I believe the problem is largely one of communal cleanliness, especially in abolishing the spitting habit.

DR. M. L. RHEIN, New York: With our understanding of local infections at the present time, I am impressed with the fact that so far as the welfare of the public is concerned, it is timely for our profession to speak in no unmeasured terms in regard to things that are being done today by dentists who know better, and whose only excuse is an economic one. One most unfortunate fact is the imperfect education of the dentist. There is no place in the practice of stomatology in the future for the man who is not thoroughly educated in medicine. A great deal has been said about focal infection, with reference to alveolar abscess. I believe it is wise to divide focal infections into two classes, the one where there is a distinctive type of alveolar abscess, and the other where there is no abscess. In the dental granulomas, where there is a distinct growth of granulation tissue, with its fibrous envelope, known in the older literature of dentistry as the blind abscess, there is no abscess, and no pus formation. We almost invariably have the colonization of the *Streptococcus viridans*. In fact, these granulomas are simply filled with *Streptococcus viridans* whose low degree of virility seems to make it impossible for them to produce pus, but they seem to have the same power of producing as severe a toxin as could come from pus itself. Where we have either of these conditions present, are they the sources of metastates? During the past year I have had recourse to the streptococcus fixation complement test, introduced by Dr. Hastings. It is a most efficacious means of determining whether the individual is having a direct effect from these infections. My clinical study of cases leads me to believe that these organisms gain their entrance to the alveolar structure at the foraminal entrances of the roots due to imperfectly handled dental operations. These foraminal openings are left unsealed.

DR. W. D. CALVIN, Fort Wayne, Ind.: When emetin was first proposed as a cure I studied two series of cases, one with the use of emetin in conjunction with a careful hygiene of the teeth, in which I found some improvement; and another in which I allowed the patients to use the same mouth hygiene as previously practiced, and with the use of emetin, and in these latter cases I did not note the same improvement. I have come to the conclusion that emetin is worth practically nothing. The only point I wish to emphasize is that we should consult with our dentist brethren more than we do. As Dr. Billings stated, the mouth probably is the dirtiest place in the human system, but I do not think that we should arrive at the conclusion that it is the cause of as many of the conditions as have been attributed to it in the last two years. We should recognize that mouth infections not only act on other parts of the body, but that the mouth is acted on by septic conditions in other parts of the body.

DR. G. R. SATTERLEE, New York: I, too, would like to emphasize the advantage of meetings between dentists and medical practitioners. A short time ago a paper was read before the Bronx Medical Society by a very well-known Boston dentist, who made the statement that he thought the medical profession was laying too much stress on infections from the teeth, and the gist of his statement was that he could not see how an apical root abscess with a strong peridental membrane and pericementum around it could possibly be the cause of a general infection. I do not suppose any medical man among us has failed to have at least one case where an alveolar abscess, that has been relieved by withdrawal of the tooth, has not been followed by relief of the patient's symptoms. Of course, the difficult thing is to decide whether it is a concomitant or whether it is the cause. I think we all agree that it ought to be taken care of anyway. I would like to ask the speakers one question—and particularly Dr. Billings—as to the value of the complement fixation test in the identification of different types of organisms; just

what organisms can be identified by a complement fixation test; what types respond to it, and if, by injection of a vaccine of that particular type, we obtain a local reaction in some part of the body, would that reaction give any clue as to the locality of the cause of the infection?

Dr. William C. Fisher, New York: There seems to be an idea among the medical and dental professions, and it is getting among the laity, that in order for a dentist to treat roots properly he must have the M.D. degree. No one wants the higher education of our dentist extended more than I do, but there are thousands of dentists in the United States who have only a dental college education, and have been properly trained in dental surgery. There is no excuse for any dentist not doing good root canal work, even if he has only the education which he received from a dental college. While a medical education is of great aid to the dentist in his diagnostic work and in his collaboration with the medical man and in research work, yet I do not wish to see the responsibility lifted from the general dental practitioner who has only a dental degree, and I do not want the public and the medical profession to think that the something that was not given him in the dental college is the reason why we have this poor root work. They have sufficient technical education to do good root work, and if they do not do it, the fault is with the individual man. If a tooth is devitalized and the roots have never been filled, and still the Roentgen ray does not reveal any shaded area or subnormal area beneath the root, that is not an assurance that there is no infection there. If the Roentgen ray shows a devitalized tooth that has not had proper root treatment, then that tooth should be opened and an attempt made to treat it. If the dentist cannot go through to the apical foramen of each and every root of that tooth, then that tooth should be extracted. My reason for that is the fact that in a case of arthritis a few weeks ago there were two such teeth, lower molars, on both sides of the jaw, that it had been impossible for myself and one other dentist to get through. I insisted on extraction, and my bacteriologic confrère reported in a few days that he had *Streptococcus viridans* from the apexes of both molars. The roentgenograms in this case were read by our most expert men, and they could not find any shading at the ends. The general practitioner was looking for a focus of infection, and we found two areas in those root sockets.

Dr. John E. Nyman, Chicago: Local infections of the mouth which cause systemic derangements may be divided into two classes. First, the open discharging variety, those that produce systemic derangement by reason of their influence on and through the digestive tract, such as discharging pockets of pyorrhea unaccompanied by pain or soreness about the teeth, and resulting in a slow systemic toxemia. Second, the enclosed form of focal infection, producing systemic derangement directly through lymph and blood vessels. The first form of infection may give rise to digestive derangement; the frequent hyperchlorhydrias without definite cause, resulting later, perhaps, in gastric ulcer; or in spastic constriction in the colon, predisposing to acute or chronic subacute attacks of appendicitis. These toxemias are sometimes related to mental derangements. I think Dr. Craig of New York reported some twenty cases of melancholia which showed no improvement until pyorrheal conditions had been eradicated. The other form, that of metastatic infection through the lymph and blood channels, may result in such conditions as chronic arthritis, single or multiple, also in cardiac derangements with an intermittent angina, or cardiac insufficiency. Through my association with men who are in the practice of medicine I can relate a list of diseases which were really definitely relieved, even cured, by correcting the abnormal conditions in the mouth. This list comprises arthritis, cardiac derangement, angina, hyperchlorhydria, spastic constriction of the colon, reflex neuroses, insomnia, and all forms of phobias. My experience has been that many phobias and insomnias have been due to mechanical disturbance by impacted unemptied teeth. Recently I had three cases which have been cleared up by removal of badly impacted teeth. Even if no definite systemic disturbance of any kind is reported coincident with pathologic conditons in the mouth, the continuance of these conditons in due course of time has its effect on the tissues of the body, resulting in a form of cell depreciation, so that the individual is more susceptible to an acute invasion. I am glad Dr. Irons spoke as he did concerning vaccines. There is always danger in the use of vaccines of developing a state of "sensitization" or a form of anaphylaxis. In subacute chronic arthritis we have not a disease to deal with which is ordinarily dangerous or acutely distressing to the individual, and we may, in administering a vaccine for the purpose of quickly eradicating that condition, "sensitize" the patient so that if some dangerous condition develops through meningitis, diphtheria or tetanus which requires the administration of a specific serum the injection may result in a fatality.

Dr. W. A. Price, Cleveland: I recently asked the pathologist in a hospital what proportion of the teeth he saw extracted were related, directly or indirectly, with the lesion for which they were extracted, and he said, "Not 25 per cent." Again, one of our leading medical pathologists stated that every tooth with a devitalized pulp was a sequestrum. Therefore, devitalized teeth must be extracted. In the researches we have been making in the Research Institute of the National Dental Association we have not been able to sterilize one single canal, so that where there was not a fistula we could not aspirate a culture from beyond that apex after the treatment. More than that, we have never been able to produce a condition in which we could not get the culture from a canal, without a fistula, where there was an apical infection, within six days. This was the case, no matter what medicine was used. We tried everything from sulphuric acid to formalin, and various medicines which we knew should not have been used in ordinary conditions, but which we used as part of the experiment. So far as I am concerned, I cannot sterilize the area beyond the tooth apex by any means, but I do believe we dentists can so change the balance of safety for that patient that we will reduce the infection and give nature a chance to destroy that infection.

Dr. Frank Billings, Chicago: I thought I stated distinctly that the reaction of pathogenic organisms invading the tissues anywhere would produce a serous, a fibrinous or a purulent exudate, and I named some other conditions. Apparently the difference in the reaction of the tissues depends on the virulence of the specific infectious agent. In the one event it is virulent enough to cause a positive chemotaxis, and leukocytes wander through the local tissues and if in sufficient numbers, we call it suppuration. If less virulent, it allows less reaction, fibrinous in character, and walls off the microorganism. In a less virulent type and on the surface of the serous and mucous membranes, a serous exudate is caused, which may wash away the infectious agents. Therefore, a degree of pathogenesis, as we understand it, is the thing which characterizes the reaction which takes place in these tissues. Then, when we go further, and with the members of the streptococcus group attempt to say that this one does this and that one does the other thing, because it produces certain characteristic conditions on a culture medium, we are going far astray. Schottmüller classified the streptococci which are pathogenic for man. He found that one type destroyed the blood corpuscles of the medium; therefore, was hemolytic; another one produces mucous conditions, and he called it the *Streptococcus mucosus;* another one produces green halos about the colonies, with some destruction of the red cells, and he called it *Streptococcus viridans.* The theory that the *Streptococcus viridans* is the least virulent of all streptococci cannot hold, because the different strains which have the power to produce green in the culture medium have not the same virulence or pathogenicity. Nor can we say that the one that destroys blood is always a pus-producing one, because the *Streptococcus erysipelatus* does not usually produce suppuration. It has an affinity for the subcutaneous tissues and does not usually produce pus. *Streptococcus viridans,* having its source in some focal infection, may have that tropism which I mentioned, which makes it pathogenic for the endocardium. If the endocardium is scarred by an old disease, it may therefore make a better soil, and enormous vegetations are produced on the valves. There will be a constant bacteremia. It will immunize itself against the host. Another type of *Streptococcus viridans* may produce changes

in joints and muscles and have no affinity whatever for the endocardium. All these organisms are the so-called endotoxic bacteria, and we are in doubt as to whether the toxin is the specific agent that produces the tissue reactions, whether it is the protein combined with the toxin that produces the reaction, or whether it is some split product of the protein, as Vaughan believes. There is something specific about it, otherwise we would not have the one producing pus, the other an erysipelas, the other infection of the heart, another acute rheumatism, another chronic affections of the muscles and joints. Therefore, when you ask about vaccines you must first of all make the bacteriologic diagnosis, to know that you are using the specific agent that causes the disease. We have attempted to study the possible value of so-called autogenous vaccines. In over five hundred cases of chronic arthritis we have compared the results of the vaccinated patients with those not vaccinated but receiving the same hygienic treatment, and the result was apparently just as good without as with the vaccines. Furthermore, where one would sometimes note a local reaction from a vaccine, the same reaction would also result from a nonspecific protein.

Swallowed bacteria meet with resistance of the intact mucous membrane throughout the intestinal canal. They meet with destructive influences of the gastric juice, and it is a question always as to how many pass on into the intestine. To say that they are destroyed there and the toxins absorbed to produce general disease is going away back to our old ideas of autoinfection or autointoxication. If intestinal infection does occur, it must mean that the organisms are viable enough, resistant enough, to pass the barrier of the stomach, reach the intestine and pass into the mucosa, and from that into the lymphoid structures of the mesentery, and there form a new focus. Practically, general infection occurs hematogenously or lymphogenously. Even if the lymphogenous infection occurs first, the infectious agents pass from the lymph nodes into the blood stream, and finally, therefore, the route of infection is hematogenous. We must get away from our old ideas of toxin absorption from a focal infection or from the gastro-intestinal tract as causing general disease.

Finally, when we come to therapy dentists need not feel at all mortified about what they do. It is not a question always, I think, of technic in dental practice. It is a question as to how you are going to get rid of existing conditions. The condition of the host is important, not only in primary infection, but in the continued infections as well. If the dentist does not recognize that the condition of that patient whose mouth he is treating requires that he should go to some doctor who is wise enough to build up his natural defences by hygienic measures, then the dentist is not doing his part for the patient. If the doctor to whom the patient is sent by the dentist, because he finds focal infection about the jaws, does not recognize that focal infection is more dangerous in individuals who are debilitated and does not do his part, he should not blame the dentist because he does not eradicate the focus.

DR. F. B. MOOREHEAD, Chicago: The one vital thing that the dentist must face in this matter of chronic infections is this: He alone is responsible for the removal of infection from the mouth. It is a demonstrable fact that certain well defined infections may result from foci about the teeth. Whether at the time the patient may be sick or well there is always a margin of doubt, a margin of contingent disability that the patient must be guarded against. The dentist, therefore, must make certain that the tissues have been placed in a state of health before the patient leaves his hands. In the hands of highly trained men certain conservative measures may be undertaken, but the general practitioner, the average man, may not assume the rôle of a specialist. The tissues of the mouth should not be looked on with an unwarranted suspicion. Infections about the teeth should be regarded in the same light as infections involving the appendix, gallbladder or the tonsil. It would seem to be a matter of plain, ordinary common sense to remove infection wherever it may be found.

METHODS AND RESULTS IN GASTRIC SURGERY *

GEORGE W. CRILE, M.D.
Fellow of the American College of Surgeons
CLEVELAND

The basis for this paper is a critical study of 472 operations on the stomach performed by my associates, Drs. Bunts and Lower, and myself, and in the records of Lakeside Hospital. Of these, 132 were performed by Dr. Lower and myself in accordance with the principle of anociation, these cases including explorations in cases of inoperable cancer, resections, and gastro-enterostomies for cancer and ulcer. Among these 132 cases there have been three deaths, a reduction from the former mortality rate in like cases of not less than 3:1. In but one other field is anociation so strikingly beneficial — in the surgical treatment of exophthalmic goiter.

Originating in the great school of Vienna, fostered in Germany, its progress accelerated by Mayo-Robson, given a classic status by Moynihan, mechanized by Murphy, and culminating in the Mayo Clinic, the great field of gastric surgery through trial and error, progress and extension has become established; yet in bad risks the mortality is still too high.

That the high mortality rate of gastric operations has been due not to faults in operative technic but to some unappreciated underlying factor is evidenced by the always comparatively low mortality rate of operations on the pelvic organs. Why have the excisions of large pelvic tumors, for example, always caused fewer deaths than major operations on the stomach or on the intestines? It is because the functions of the stomach and intestines govern so completely the balance of material for constructive metabolism.

This fact not only gives us the key to the fundamental cause of the high hazard in major gastric operations, but also suggests a plan of attack by means of which the mortality of these operations may approach the low mortality of pelvic surgery.

Whether the case be a resection for cancer or a gastro-enterostomy for ulcer, the reserves of the starved patient must be built up by the introduction of water, sodium bicarbonate and glucose and especially by an adequate amount of sleep and rest; and acid formation must be diminished by the elimination, as far as possible, of worry, fear, anxiety, exertion, loss of sleep, trauma and anesthesia.

In the case of ulcer, the fate of the ulcer-bearing area is the chief consideration, for the evidence on many sides, especially that presented by the Mayo Clinic, shows the tendency to cancer growth in ulcers of the stomach, though happily not in duodenal ulcers. Our lamented President, Dr. Rodman, made a logical departure in the complete excision of the ulcer-bearing area, but even this is not enough. At this point we must join hands with our medical confrères and for a period of many months — six or more — the patient should be kept under strict dietetic care, such, for example, as the Sippy regimen. If the patient is dismissed from the surgeon's care to the same habits of life, and the same dietetic carelessness that existed when the ulcer originated, and if in certain cases mouth infections and teeth defects are uncorrected, then there is bound to result a certain percentage of

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

failures. It is just as illogical to exercise no care over a postoperative ulcer patient as it would be to dismiss a postoperative exophthalmic goiter patient without therapeutic instructions and prolonged oversight.

After surgical treatment for ulcer, as after a thyroidectomy, the immediate relief is so marked that it is difficult to make the patient believe in the necessity for special care during a long period.

The clinical results of the surgical treatment of duodenal ulcers are even more striking than in cases of gastric ulcer. The rapid disappearance of gastric ulcer masses is illustrated by cases reported by Lilienthal and Willy Meyer in which ulcer masses supposed to be carcinoma have disappeared within a week or more after gastro-enterostomy, as proved at the second phase of a two stage operation. I myself have seen three such surprising results.

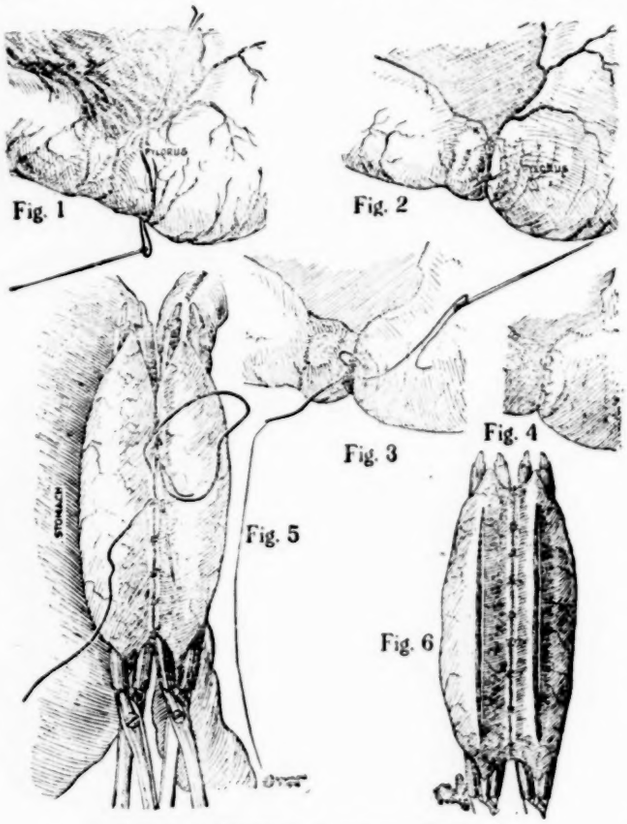
TECHNIC

As has already been stated, the principle of anociation is applied throughout the operation — minimum handling; feather edge dissection; avoidance of pulling and tearing manipulations; the injection of novocain before the division of skin, fascia, muscle and peritoneum; and a massive infiltration with quinin and urea hydrochlorid, at a distance from the line of incision, immediately after the abdomen is opened.

Shall the pylorus be occluded? By what technic? In the light of our experience occlusion of the pylorus is rarely required, as the relief without is about equal to that secured with occlusion. When the pylorus is occluded, a simple method, such as a circular tying with a suture reinforced by interrupted stitches of silk, answers well.

The Jejunal Loop. — The most important mechanical problems are the length of the jejunal loop and its direction. The length should be most carefully considered. If the loop is too short there will be intermittent interference with the desired current of the jejunal content which at times will accumulate in the stomach. If the loop is too long a vicious circle may become established. The correct position and the length is that which equalizes the pull on the supports of the stomach and the jejunum. This adjustment can only be secured empirically and cannot well be described.

Shall the loop run from right to left or vice versa? The direction should be that which mechanically is the more comfortable. If the stoma is placed near the pylorus, then usually the loop runs from left to right; if the stoma is well toward the left, then the loop runs from right to left.



Figs. 1-4.—Occlusion of pylorus, Steps 1-4.
Fig. 5.—Right-angled stitch including muscularis.
Fig. 6.—Incisions in stomach and jejunum.

The Stoma.—The work of Cannon and Blake and of others shows that food propulsion is under functional control rather than the control of gravity. Therefore a stoma near the pylorus is sanctioned for physiologic as well as practical reasons; a stoma far from the pylorus may cause serious stasis. Since the stoma exerts no control over the propulsion of food in either the stomach or the duodenum, its direction, whether oblique, transverse or longitudinal, is unimportant. The stoma tends in time to become oval or round with a sharp margin. Even a large stoma does not materially interfere with the retention of stomach contents during the early hours of digestion; and a very small stoma, like a very small pylorus, may allow enough food to pass through.

In two outside cases I enlarged a stenosed stoma, but in none of my own cases has the stoma shown an impairing contraction, whether the pylorus was closed or open, apparently making no difference.

The Incision Through the Mesocolon. — Owing to its extreme elasticity, it matters little whether the incision through the mesocolon in a posterior gastro-enterostomy be vertical, horizontal or oblique; but it should not divide large arteries. The incision may be enlarged in several directions, but always by division with a sharp knife, and not by tearing.

The Suture.—The suture must prevent bleeding and leakage and must maintain absolute coaptation of the serosa. For securing these ends the cobbler stitch inserted with Bartlett needles is ideal. Mayo has pointed out a serious objection to the use of silk for the inner suture — it may remain indefinitely and cause ulcers. We have found it the best procedure to use chromic catgut for the first row of sutures, these being reinforced by interrupted right-angled silk sutures including the muscularis. In no case has there been serious hemorrhage.

The Jejunal Angles and the Opening in the Mesocolon.— Unless guarded against, acute angulation of the jejunum at its junction with the stoma may occur. This may be prevented by the insertion of several silk sutures to hold the afferent and the efferent loops closely against the stomach. A more serious occurrence is a mass herniation of the small intestine through the opening in the mesocolon. This in turn is prevented by suturing the margin of the mesocolon opening to the stomach approximately an inch above the margin of the stoma.

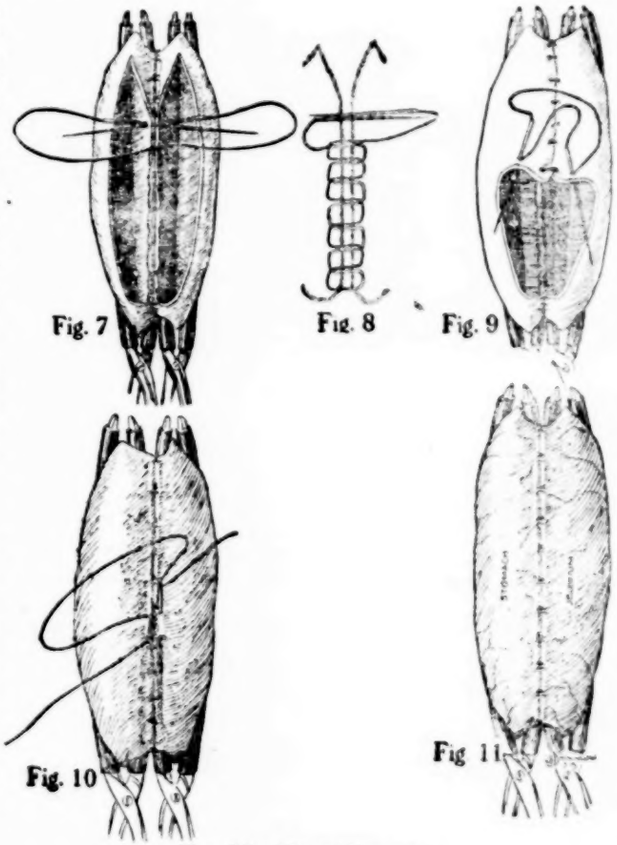
This procedure also gives freedom to the stoma and the jejunal loop.

SUMMARY

In starved cases of gastric cancer or ulcer the reserve alkalinity of the body has been reduced. Nutrition is impaired, the reserve stores of water and of potential energy are diminished. Surgical treatment, therefore, includes the preoperative and postoperative introduction of water, of alkalies and of glucose in large quantities; the management of the patient by interns and nurses in such a manner as to avoid such acid forming activations as anxiety, loss of sleep and exertion; the application of the principle of anociation throughout the operation itself, and in cases of ulcer, a prolonged postoperative period — six months at least — under therapeutic direction, especially as regards diet.

ABSTRACT OF DISCUSSION

DR. ALBERT J. OCHSNER, Chicago: With the ordinary stomach operation with the patient in a fairly good condition there should be no mortality. But in this class of cases there is a considerable number of individuals who have lost this reasonable amount of margin of safety and here we find the mortality. The other cases in this class have no mortality and surgical judgment is the element that reduces the mortality. There are certain things that can be avoided which if not will narrow this margin of safety to a dangerous degree. If the traumatism and the strain on the nervous system are reduced to the very slightest amount then you have removed the portion that is lacking in these patients and you place these particular patients that give the mortality ordinarily in the same favorable class with the rest. Dr. Crile's way of excluding the pylorus seems very attractive. I think that it will be necessary, however, to place the sutures rather more deeply than most surgeons would be inclined to place them because if they are not placed more deeply the communication will be reestablished afterward, and judging from the illustrations shown the sutures were evidently placed more deeply than they are ordinarily placed. I wish to direct attention to another point in which he also increases the margin of safety, namely, in the careful suturing of the wound between the intestine and the stomach so that there cannot possibly be any loss of blood after operation because a little loss of blood in this class of cases is of the greatest importance.



Figs. 7-9.—The cobbler stitch.
Figs. 10-11.—Interrupted right-angled stitch over cobbler stitch.

DR. R. C. COFFEY, Portland, Ore.: Dr. Crile has failed to emphasize sufficiently one of the principal reasons for his splendid results, namely, that he uses two stages or sittings when he is doing an excision operation.

In our experience the adoption of the two-stage operation has been the most important single step we have taken in abdominal surgery of any kind for some time. In excising portions of the pylorus our mortality has certainly been decreased at least two or three times when compared with results in similar cases done at a single sitting. We have not had a single fatality from the second stage of the operation for four years. The mortality we have had in gastric surgery has been confined to the primary gastro-enterostomy. In other words, the two-stage operation reduces the mortality in an excision to practically the same as a simple gastro-enterostomy. I would like to ask Dr. Crile to explain his view of the cause of the improved results following the two-stage operation. Is the first operation intrinsically more serious, or does it produce a sort of immunity for the second operation? The question as to the cause of secondary ulcer has not been settled. Dr. Mayo believes it is due practically always to the linen or silk suture. We have not been entirely convinced. We have had four ulcers of this type. It is true we have found linen suture at the base of the ulcer in three instances, but the ulcers have extended 2 to 3 inches away from the suture and in one case in which we used catgut entirely we had an ulcer of the same kind. Curiously enough the four ulcers occurred in two patients. In each case the ulcer recurred and in one of these cases at least it recurred after the second removal that we know of in spite of the fact that catgut was used throughout. There is a point we learned in experimental surgery. An interrupted silk or linen suture that penetrates all the coats of the stomach and intestine is eliminated in a few days into the lumen. A suture that does not penetrate the deep tissues remains encysted. A continuous suture which penetrates the lumen at some points and is only peritoneal at other points can neither eliminate itself into the lumen nor can it become encysted. It is in this class that we have found the suture still hanging in the wound. This is undoubtedly the type of suture that is frequently found in these cases of secondary or recurring gastro-jejunal ulcer and may be simply an innocent bystander.

DR. HENRY O. MARCY, Boston: Twenty-five years ago I demonstrated that buried absorbable sutures should be used in operations of this type and slowly came to the conclusion on experimental evidence that catgut was defective and kangaroo tendon sutures were greatly to be preferred. They were prepared in a careful way by chromicizing and thus made durable. Again, the way in which they were applied. Dr. Coffey said that it is unwise to penetrate all the coats of the intestine. Of course, since the intestinal contents are infective one must be sure to have the strong connective tissue layer of the intestine included. For over twenty-five years I have used the continued double tendon suture, the so-called cobbler stitch. I use a needle with an eye near the point. It is rethreaded with the opposite end and thus carries the suture through one and the same opening. The superficial layer of sutures is carried through the external coat only but must itself be buried. In other words, it is absolutely buried. In this way, as Dr. Crile has emphasized, one damages the parts a great deal less than in any other and saves the lesions that are so likely to occur, to make adhesions and give subsequent trouble.

DR. JOHN B. DEAVER, Philadelphia: As to anociassociation, I will say little as I know practically nothing about it, but from the fact that it is recommended by Dr. Crile we must

take it that it is valuable. I would take exception to what Dr. Crile says in reference to pyloric occlusion. This is only a makeshift. It is not permanent. I have operated in cases the second time that I had originally operated myself and I know that with few exceptions pyloric occlusion is not particularly satisfactory. When the pylorus is tied off tightly the tissues are devitalized and as a result we have ulceration, separation and restoration of the lumen. I strongly emphasize cutting out the ulcer when it is possible; this is my practice. In the last forty cases I have done at the German Hospital, among which were many pylorectomies, there was no fatality. The majority of ulcers of the duodenum are situated in the first portion anteriorly; and when the induration is not too pronounced the ulcer can be excised; when induration is considerable amputation of the duodenum and posterior gastro-enterostomy, in other words pylorectomy, are indicated. Where the ulcer involves the lower portion of the first part of the duodenum coming in close proximity to the head of the pancreas it is my practice to dissect the duodenum away from the pancreas, purse-string it, invaginate and so forth. Where induration is extensive and where it is impossible to purse-string, I oversew the duodenum and sew the stump into the head of the pancreas. As to the subsequent course of these cases I am prepared to say that they go along nicely if they are not medicated. A small number are nauseated; some vomit, which is relieved usually by one lavage or by lavage repeated two or three times. Lavage is of most importance in the after-treatment of these cases.

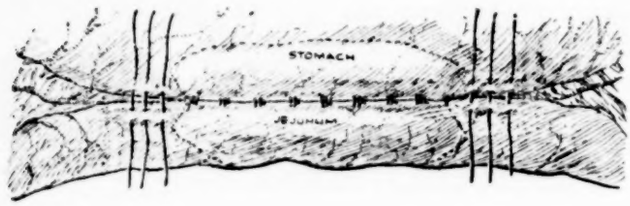


Fig. 12.—Stay sutures inserted at each end of completed anastomosis: above, untied; below, tied.

DR. ALFRED A. STRAUSS, Chicago: Dr. Crile has advanced the technic of gastro-enterostomy, but I do not believe that he has advanced the work on pyloric closure when he uses a silk ligature method, which is only a temporary closure for a chronic indurated ulcer. Ulcer of the pylorus and duodenum is primarily a medical disease, and careful medical treatment will heal many of these ulcers. When the ulcer has become chronic and indurated, surgical interference is indicated. I do not believe that a temporary closure with a silk ligature, which does not hold the pylorus closed any longer than from ten to thirty days, is of any value in a chronic ulcer of the pylorus or duodenum, which takes weeks and months to heal. I have recently fluoroscoped a number of such cases in which the pylorus was closed over by a silk ligature the size of an umbilical tape. In one case the pylorus was opened and the bismuth meal passed through at the end of ten days, in another case at the end of eighteen days, and practically all of them were open at the end of twenty-one days. In addition, two of these cases had almost fatal hemorrhages. What value has such a temporary closure on a chronic indurated ulcer? We know from fluoroscopic and Roentgen ray work that from 40 to 50 per cent. of the food passes through the pylorus, no matter how well the gastro-enterostomy has been performed and placed. Therefore, the irritation to the ulcer surely cannot be lessened sufficiently to produce healing. The only way in which gastro-enterostomy alone helps is from the fact that the bile secretions regurgitate through the opening into the stomach and alkalinize the secretions. This surely cannot be constant, for if 50 per cent. of the food passes through the pylorus anyway, this food as it passes over the duodenum neutralizes the bile. So the only time bile can flow in any quantity through the gastro-enterostomy is when the stomach is empty or no food is passing over the pylorus. Therefore, if a pyloric closure is indicated at all, a permanent closure is indicated, such as von Eiselsberg's unilateral exclusion, or the simple submucous fascial transplant method which I devised. This fascial transplant closure has been shown to be absolutely permanent, and certainly is not an additional risk to the patient. There is no chance of hemorrhage or infection. I have so far seen no case of leakage following this procedure.

DR. G. W. CRILE, Cleveland: The discussion has focussed largely on a procedure we rarely do — namely, the occlusion of the pylorus. We have found out from experience that without any occlusion of the pylorus the symptoms disappear, and the jejunal lesion heals promptly. I am inclined to agree with Paterson that in all gastro-jejunostomies a certain amount of alkaline fluid comes through the new stoma into the stomach and reduces the acidity; this probably is as much a curative factor as any other feature of the procedure. Dr. Coffey raised a very interesting point. I think the reason the first contact with the very bad risk patient is so menacing is because of the narrow margin of safety due to starvation. Dr. Deaver's more radical views show that in a large measure each surgeon must be his own monitor. In these starved cases we must sometimes resort to the technic of Von Eiselsberg, viz.: at first merely bring up the jejunum under local anesthesia and feed through a tube in order that the reserves of the patient may be increased. In this short paper it has been impossible to explain the reasons for many of the steps suggested. Our purpose has been rather to sum up in a very practical way the present status of gastric surgery in the Lakeside Clinic.

A ROENTGENOLOGIC STUDY OF THE GASTRO-INTESTINAL TRACT IN DIABETES

A REPORT ON SEVENTY-TWO CASES *

JAMES T. CASE, M.D.

Fellow of the American College of Surgeons; Associate Surgeon and Director of the Roentgen Department, Battle Creek Sanitarium

BATTLE CREEK, MICH.

A toxemia of alimentary origin has long been considered one of the probable factors in the causation of diabetes. The purpose of this paper is not to affirm or deny the validity of such a claim but to summarize the statistics in seventy-two cases recently examined through the courtesy of my colleagues, Drs. C. C. Hubly and C. S. Staines, of the staff of the Battle Creek Sanitarium.

The majority of diabetics give a history of constipation or, what is worse, constipation alternating with diarrhea. Although most authorities urge the necessity of careful attention to intestinal hygiene as a part of the treatment of this malady, the literature contains very few articles dealing specifically with intestinal stasis as a cause of diabetes.

Brosch[1] reported the necropsy findings in a patient of 60 who had died comatose and uremic with slight jaundice. The urine had shown large quantities of sugar and albumin. On opening the abdomen at postmortem it was evident that the pancreas had been compressed by the chronically distended large bowel.

* Read before the Section on Pathology and Physiology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Brosch: Virchows Arch. f. path. Anat., 1912, ccviii, 426.

The lower ileum contained fecal matter of light brownish color and of rather dense consistency. As a result of his necropsy studies in this case, Brosch was convinced that the dilated part of the intestine above the obstruction exerted pressure on the descending part of the duodenum and that there had followed changes in the pancreas itself and in other neighboring organs.

A. C. Jordan[2] feels sure there is a very definite relation between diabetes mellitus and chronic intestinal stasis. He cites two interesting cases, both of which show marked ileac delay associated with kinking of the terminal ileum. The so-called "writhing" duodenum was observed in one of the cases, in which there was also found gastric delay considerably longer than six hours.

N. Mutch[3] believes the determining factor in the production of diabetes mellitus is a chronic inflammation of the duodenum, generally associated with ileac stasis, which aggravates the condition in proportion to its severity. By Roentgen examination and orthodiagraphic measurements, he found that the average vertical length of the duodenal shadow in healthy adults was 3½ inches, or the space of two lumbar vertebrae with their intervening disks. In eleven cases of diabetes mellitus he found that this vertical length varied from 3 to 3½ vertebrae, or from 4½ to 5½ inches, and was accompanied by an increase in the diameter of the tube as well. In one case examined after death, he found that the walls of the duodenum were thicker than normal, and that these changes extended down into the jejunum. He believes that chronic duodenitis is the determining factor in the production of diabetes mellitus, and that ileac delay increases the severity of the disease by causing stagnation in the duodenum.

Croftan[4] expresses the opinion that intestinal toxemia, causing prolonged injury to the liver and pancreas with the production of alimentary glycosuria, may be one of the factors in the production of permanent diabetes.

Roentgen studies in the seventy-two cases on which this paper is based were carried out according to the definite routine which I established some years ago in the Roentgen department of the Battle Creek Sanitarium. According to this routine the patient reports at the Roentgen department at 8 o'clock in the morning, having abstained from food or drink since arising; thus one is assured that he finds the patient with an empty stomach, and hence any residue in the stomach must mean gastric delay or hypersecretion. No laxatives have been ordered, the patient having been instructed to refrain from laxative drugs or laxative means of any sort for the twenty-four hours preceding the examination; in other words, one attempts to examine the patient under the ordinary conditions of life.

The test meal consists of 2 ounces of barium sulphate (especially tested for Roentgen-ray purposes) stirred into 14 ounces of Oriental buttermilk. This the patient takes while being watched with the fluorescent screen. Manipulation is carried out in both the horizontal and vertical positions, after which the patient is dismissed with instructions to return at the second, fifth, ninth and twenty-sixth hours for observation. If the barium has not been evacuated at the twenty-sixth hour he is asked to return as many times as may be necessary to find the bowel completely emptied of barium residues. These observations are made at the fiftieth and seventy-fourth, and if necessary at the ninety-eighth hour. When the colon is seen to be emptied of the barium residues, the patient is told to return at 7 on the following morning, at which time the colon is emptied by means of three cleansing enemas, each of 1 pint, given one after the other, each one being retained for five minutes and expelled before the administration of the next. After an interval of about two hours to allow the expulsion or absorption of water residues, the patient is given a colon injection consisting of 3 ounces of barium sulphate in a suitable vehicle, the total enema amounting to 2½ pints. Rarely 3 full pints may be needed. Thus the patient will have been seen on from eight to eleven different occasions, the findings being noted down from time to time by an attendant.

The tests having been completed, the examiner is now ready to make his report. This is dictated from the records made at the time of these various tests, with such aid as may be afforded by special roentgenographic records ordered at appropriate intervals during the examination.

As a preliminary to the foregoing examination, before any barium has been given, the patient is sent to the roentgenographic room for two or three plates of the gallbladder region in the hope that gallstones, if present, may be identified. In 1913, before the surgical section of this Association, I made the statement that gallstones could be recognized roentgenologically in 40 or 50 per cent. of cases. I based this statement on the finding of forty-eight cases of gallstones in 1,000 consecutive bismuth meal examinations. I later analyzed a series of 300 consecutive laparotomies performed in the Battle Creek Sanitarium Hospital by Drs. Kellogg, Harris and myself, in all of which a preoperative Roentgen examination had been made, finding that the Roentgen-ray report had been positive for gallstones in half the cases in which gallstones were found at operation. In a series of 5,000 consecutive examinations in which the gallbladder was included (examinations of the alimentary tract, gallbladder, right kidney or lumbar spine), gallstones were identified roentgenologically in 5 per cent. of all the cases.

In our series of seventy-two diabetics, gallstones were found definitely in six cases, or 8 per cent., and in eight more cases there were very suspicious shadows, some of which were proved to be gallstones at subsequent operation. Some criticism has been offered concerning our practice of reporting suspicious shadows. Certain surgeons remarked that they did not operate on suspicion. The only reply to such criticism is that we can see nothing else in an exploratory laparotomy than operation on suspicion. We feel that these suspicious shadows should be reported, for if note is made of them, the surgeon will be more likely to exercise special care in palpating the gallbladder at operation. Of course no operation should be based on the strength of Roentgen findings which are only suspicious unless clinical findings tend to confirm the suspicion. Evidence of gallbladder region adhesions existed in twenty-six of our cases. Hence we have a relatively high proportion of diabetic patients in whom the Roentgen evidence shows gallbladder region disease.

In view of the close relationship between gallbladder and pancreatic affections, the significance of this high percentage of gallbladder findings in diabetes is obvi-

2. Jordan, A. C.: Proc. Roy. Soc. Med., 1915, viii, Electro-Therapeutical Section, p. 87.
3. Mutch, N.: Practitioner, London, May, 1915, p. 712.
4. Croftan: Med. Rec., New York, 1914, ii, 1087.

ous. It may be remarked in passing that in a number of diabetics with gallbladder lesions, operation was performed for removal of stones or for chronic gallbladder infection, with very satisfactory results, several of the patients becoming entirely sugar free and remaining so.

As might be expected in a series of cases presenting gallbladder region adhesions, we find a correspondingly large percentage of transverse stomachs, the unusual position being due in part to hepatofixation. It should be remembered, however, that one frequently finds a transversely placed stomach in the more or less obese persons who comprise the major proportion of our diabetic cases. Carcinoma of the stomach was found in two cases, not including two other cases in which carcinoma of the pancreas was determined.

The emptying time of the stomach was unusually rapid, being considerably less than four hours in forty-six cases; less than five hours in sixty cases, and less than six hours in seventy cases. In the two remaining cases the emptying time was seven and seven and one half hours, respectively. In both there was found tumor of the pancreas, one of which at least proved to be carcinomatous.

These findings in relation to the motor functions of the stomach agree very well with the clinical studies of various investigators. Gilbride[5] found that the motility of the stomach is usually increased and gastric secretion diminished. It is commonly known that with diabetics one cannot wait the usual forty-five minutes to aspirate the stomach contents after the Ewald test breakfast. In order to obtain any stomach contents the aspiration must be performed in thirty minutes, and in some cases at the end of twenty minutes. It is possible that the low hydrochloric acid content of the gastric juice in diabetes is in some way responsible for the development of this disease.

In view of the work of Mutch and Jordan, already referred to, considerable interest centers in the question of duodenal stasis. In our series duodenal stasis was observed in only one instance, although a special effort was made to confirm the findings reported by the authorities just named. Perhaps the discrepancy in our findings is due to a difference in definition of duodenal stasis. It would seem that duodenal stasis should imply the retention of barium residues in the duodenum for a time perceptibly longer than that required to empty the stomach; but, as stated above, such delay was noted in our series in only one case. In many instances the duodenum was widely filled; but so also was the jejunum, the wide filling being no greater on the proximal side of the duodenojejunal junction than on the distal side. To find the upper small bowel, both duodenum and jejunum, well visualized is common where the gastric juice shows low hydrochloric acid values; it seems to be due to the rapid outpouring of material through the pylorus characteristic of this condition.

In occasional instances (about twenty-five cases in 5,000 consecutive barium meals) we have found barium in the ampulla of Vater. Sometimes the shadow of the ampulla thus visualized was no larger than a pea; in other instances the shadow measured as much as 4 cm. in diameter, and the barium has been retained from three to four days. Elsewhere I have discussed the probable significance of this visualization of Vater's ampulla.[6]

5. Gilbride, J. J.: The Functions of the Stomach in Diabetes Mellitus, THE JOURNAL A. M. A., Feb. 18, 1911, p. 497.
6. Case, J. T.: Am. Jour. Roentgenol., June, 1916.

It would seem that if duodenal stasis were common in diabetes we should find among them a large proportion of cases of visualized ampulla of Vater; but in our series of seventy-two cases the visualized ampulla, though carefully searched for, was not recognized in a single instance. Conversely, none of the twenty-five or more cases in which the dilated ampulla was observed were diabetics.

Diverticulum of the duodenum is a rather uncommon finding under any circumstances, and up to 1911 only eighty cases were to be found in all the literature, including postmortem records. In the reference last given,[6] I reported eight cases discovered roentgenologically. Up to the present writing I have detected diverticulum of the duodenum other than the dilated diverticulum of Vater in thirteen patients; but none of them have been diabetics.

Careful observation of the duodenal shadow has failed to impress us that there is any characteristic change in the dimensions of the duodenum of diabetics as compared with normal individuals.

The finding of barium residues in the terminal ileum at the ninth hour may be considered as signifying abnormal delay. There is, of course, a normal retardation of chyme in the terminal ileum for a short period before the cecum begins to fill, this normal delay being comparable to the delay of food in the stomach. Just as food is held in the stomach to be served out in small quantities through the pylorus, so the chyme is detained in the terminal ileum to be served out at appropriate intervals through the ileocecal sphincter; but if the delay in the terminal ileum exceeds the ninth hour, we may say that the patient exhibits ileac stasis—slight, if only a few inches be filled; marked, if 2 or 3 feet of the ileum still retain barium shadows; extreme, if barium residues are found in the terminal ileum at the twenty-sixth hour. The accompanying tabulation will permit a ready appreciation of the degree of ileac stasis in a series of mild cases and in a series of severe cases of diabetes.

DEGREE OF ILEAC STASIS IN BOTH MILD AND SEVERE CASES OF DIABETES

Mild Cases		Severe Cases	
Case No.	Degree of Ileac Stasis	Case No.	Degree of Ileac Stasis
5	0	3	++
8	0	4	++
9	0	14	++
15	0	16	++
26	0	17	+++
28	0	18	+++
31	++	23	+
34	0	25	+
35	0	30	0
47	0	40	+
50	0	42	0
52	0	46	+
53	0	60	0
58	0	61	++
59	0	63	++
66	0	68	+
67	++	69	+
		71	0

Of the mild cases, the patient in Case 67 became sugar free very quickly, and she was able to remain so even on a fairly liberal diet. Case 31 was complicated by a serious neurologic condition attending syphilis.

Of the severe cases, the patient in Case 30 suffered from diarrhea. Case 42 had gallstones; Case 60 also had gallstones. The patient in Case 71 died suddenly, not in coma, the exact cause of death not being explained. The carbon dioxid tension was very low.

It is strikingly apparent that ileac stasis is a characteristic of severe cases of diabetes. It is probable that my conservative definition of ileac stasis explains why the stasis is not more apparent even in the mild cases.

A tabulation showing the competency or incompetency of the ileocecal valve in this series reveals nothing characteristic for the mild as contrasted with the severe cases. The majority of patients, both mild and severe cases, show incompetency of the ileocecal valve. Of the twenty worst diabetics the ileocecal valve was incompetent in thirteen and competent in seven. Of the twenty mildest cases the ileocecal valve was competent in ten and incompetent in ten. We have not arrived at any satisfactory means of determining the degree of incompetency except that it has been noted that in these cases with most marked ileac stasis, incompetency of the ileocecal valve permitted the enema to fill an unusually large portion of the terminal ileum; and following the meal there was often observed a regurgitation of ingested food from the cecum back into the ileum after the ileum had once been emptied.

Adhesions of the terminal ileum were found in eighteen of the seventy-two cases, or exactly 25 per cent. A careful scrutiny of the protocols fails to show any constant relation between the severity of the diabetes or the degree of ileac stasis and the presence or absence of adhesions of the terminal ileum.

Eight of the cases of terminal ileum adhesions were found in the twenty worst diabetics; four in the twenty mildest diabetics.

Marked spasticity of the distal colon was found in forty-six of the seventy-two cases. Proximal colon stasis was especially marked in fourteen cases. Adhesions about the appendix were found in a somewhat larger proportion of severe cases than of mild cases, but here again there is no constant relation between the severity of the disease and the severity of the appendical involvement as shown with the Roentgen ray, except that a slightly larger proportion of appendical involvements occur in the severe cases.

The average emptying time of the colon in the twenty worst cases was forty-eight hours. The average emptying time of the colon in the twenty mildest cases was thirty-six hours. Under the circumstances of our tests the emptying time of the normal colon would be about thirty-four hours.

Carcinoma of the colon was found in two cases and removed surgically in both cases. One patient died in coma about ten days after the operation; the other is still alive and is sugar free.

The foregoing studies were not undertaken with the idea of criticizing the work of any one else, but rather to make a tabulation of the actual findings in the large series of cases which fortunately was available for this investigation. In summarizing the findings, special emphasis is drawn to the following points:

1. Gallbladder involvements are very common in diabetes, especially gallbladder lesions attended by pericholecystic adhesions.

2. The stomach empties itself with unusual rapidity in the average case of diabetes.

3. In our series duodenal stasis was a rare finding, being observed only once.

4. An increase in the dimensions of the duodenum, either in length or caliber, was not observed.

5. There is a striking relation between the severity of the disease and the degree of ileac stasis.

6. Ileocecal valve incompetency is a common finding in diabetics, but we were unable to discover any definite relation between the degree of ileocecal valve incompetency and severity of the disease.

7. Adhesions of the terminal ileum, stasis in the cecum and evidences of appendical disease were somewhat more frequent in the severe cases than in the mild cases of our series.

8. The average emptying time of the colon in diabetics is delayed in about the same proportion of cases as one would expect from a perusal of the clinical histories. A majority of the patients show a low grade of colonic stasis. Extreme colonic stasis was found in only two instances, and both of these showed carcinoma of the distal colon.

DIRECT AND INDIRECT HAY-FEVER

PRELIMINARY REPORT OF THE RESEARCH DEPARTMENT OF THE AMERICAN HAY-FEVER-PREVENTION ASSOCIATION ON THE ETIOLOGY OF HAY-FEVER

W. SCHEPPEGRELL, A.M., M.D.
President, American Hay-Fever-Prevention Association
NEW ORLEANS

In previous reports,[1] it was stated that the reaction of hay-fever was influenced by the physical formation of the pollen. I did not, however, dwell on this part of the subject, as the object of both of these reports was to emphasize the relation of pollen to hay-fever with a view of developing interest in its prevention.

As the form of hay-fever and the cause of the reaction, however, have an important bearing on the treatment of this disease, it has been decided to report, at this time, the results of our investigations on this subject, leaving the question of the therapy based on these investigations, which are not yet completed, for a future report.

HAY-FEVER REACTIONS

In testing subjects for the hay-fever reaction, it has been frequently observed that the reactions produced by different pollens vary in character, this being attributed to different degrees of susceptibility of the patient to various plants. In the course of these investigations, in which many hundreds of tests were made, it was soon noted that there appeared to be a marked uniformity of this variation in most subjects, indicating that the difference might be in the pollens and not in the patient.

Two Classes of Pollen.—Further investigations demonstrated that this was the case. Microscopic examinations show that there are two physically distinct classes of pollen: the first, in which the outer coat (extine) is covered with minute spicules (Fig. 1), and the other in which these are absent (Fig. 2).

The spiculated pollen grains are usually spherical, as in the ragweeds (*Ambrosia elatior, trifida* [Fig. 1], *psilostachya*, etc.), cocklebur (*Xanthium americanum, pennsylvanicum, spinosum*, etc.), false wormwood (*Parthenium hysterophorus*) and marsh elder (*Iva ciliata, axillaris*, etc.). Sometimes, however, these are ellipsoidal, as in the black-eyed Susan (*Rudbekia hirta*), mayweed (*Anthelmis cotula*), horseweed (*Erigeron canadensis*), etc. They vary in size from the common ragweed (*Ambrosia elatior*) 15 microns[2] in diameter to the hibiscus (*Hibiscus palustris*), which measures 170 microns.

1. Scheppegrell, W.: Hay-Fever and Its Prevention, Pub. Health Rep., July 21, 1916, p. 1907; The Cause, Prevention and Treatment of Hay-Fever, Med. Rec., New York, 1916, xc, 95.
2. Micron is 0.001 millimeter.

The unspiculated[3] pollens vary greatly in size. The smallest that we have tested is the pollen of the Carolina plum (*Prunus caroliensis*), which measures 2 microns in diameter. The largest is the corn pollen, which measures 80 microns. They also vary greatly in shape, being usually more or less ellipsoidal but frequently spherical (Fig. 2), as in most of the grasses, four or five-sided as in the sedges, or complex in shape, as in the evening primrose.

Reaction of Spiculated Pollen.—A series of tests demonstrated that all spiculated pollens, of which the ragweeds (*Ambrosia elatior, trifida* and *psilostachya*) form the type, invariably produce a reaction when inhaled by hay-fever subjects sensitive to any one of these spiculated pollens. In over 100 varieties of pollens that have been tested, not a spiculated pollen failed to give a reaction in such a subject.

The only question to be decided with spiculated pollens is whether or not they are wind-pollinated, that is, found naturally in the atmosphere.[4] If this is the case, it is a cause of hay-fever for such sensitive subjects coming within the radius of the air which is infected. Among the plants which have been tested, and which are wind pollinated and have spiculated pollen, are the following: common ragweed (*Ambrosia elatior*), giant ragweed (*Ambrosia trifida*), rough wild elder (*Iva ciliata*), cocklebur (*Xanthium americanum*), false wormwood (*Parthenium hysterophorus*), etc.

The reaction from spiculated pollens in a sensitive subject is prompt, active and usually within two minutes. When it does not take place in three minutes, the patient is either not sensitive to the pollen, or the pollen has not reached the nasal mucus and the test should be repeated.

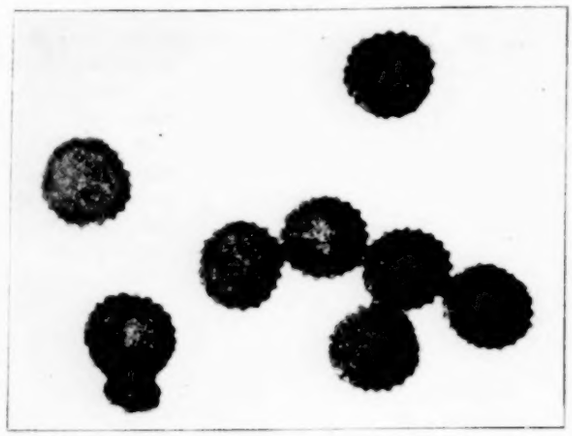


Fig. 1.—Spiculated pollens of ragweeds (ambrosias) low in protein.

The character of the reaction bears a direct relation to the length of the spicules of these pollens. In the common ragweed (*Ambrosia elatior*), in which the spicules are 2.1 microns in length, and the giant ragweed (*Ambrosia trifida*), in which they are 2.8 microns, the reaction is prompt and active. In the cocklebur (*Xanthium americanum*) and the rough wild elder (*Iva ciliata*), the spicules are shorter, being 0.7 and 0.5 microns, and the reaction is proportionately less active than with the ragweeds (ambrosias).

Reaction of Unspiculated Pollens.—The reactions from unspiculated pollens are delayed and less marked, although they may be quite prolonged. They are caused not by local irritation but by the absorption of the protein contents of the pollen. In the grass pollens, which have a high percentage of protein, the reaction is positive. In the sedges, pine, palmetto, etc., in which the pollens are smooth, but contain an inappreciable amount of protein, the reaction is negative. In the careless weed (*Amaranthus spinosus*), goose foot (*Chenopodium anthelminticum*), yellow dock (*Rumex crispus*), and other weeds of this class, the protein is low and the reaction is correspondingly mild.

The tests also demonstrate that all pollens high in protein (unspiculated), of which the grasses form the type, invariably produce a reaction when inhaled by a hay-fever subject sensitive to any one of such pollens.

Sensitization to both spiculated pollens and to (unspiculated) pollens high in protein is general, but varies with individuals, most persons being more sensitive to the former but some to the latter. The development of the disease from one or the other, however, usually depends on the proximity of the infecting weeds or grasses.

After the foregoing facts had been established, the character of the reaction could be predicted from the microscopic examinations of the pollen. The microscopic examinations should always precede the biologic test of pollens. Recently (August 20) a wild rose was sent from North Carolina to be tested and was found to contain seven times as many spiculated ragweed pollens as its own smooth pollens. During the active pollinating season of the ragweeds, the infection of other flowers with the ragweed pollen is of common occurrence, and a biologic test without a microscopic examination may be misleading.

Reagents for Protein.—In making the protein test in pollens, many reagents have been tried and also the polariscope. Eventually, however, the iodin test was found the most simple and practicable. As iodin is almost insoluble in water, the following solution is used:

Iodin crystals..... 5 grains
Potassium iodid....10 grains
Distilled water.... 1 fluidounce

A drop of this is applied by means of a pipet to the edge of the cover.

The iodin reaction should be tested by means of condensed reflected light, a white porcelain plate being used as a substage. In this way, the diffusion of transmitted light through the pollen is avoided, and the contrasting colors are more easily detected.

Protein Reaction in Grass Pollens.—The iodin test shows that all the grasses (*Gramineae*) including corn, rye and rice,[5] are rich in protein. With this stain, the pollens rapidly become light blue, which gradually darkens until they become almost black (Fig. 2). Pollens without an appreciable amount of protein show only the yellow-brown stain of the iodin. Pollens with a low percentage of protein, as the careless weed (*Amaranthus spinosus*), yellow dock (*Rumex crispus*), goose foot (*Chenopodium anthelminticum*), etc., are stained violet, the shade indicating the degree to which protein is present. In some pollens, such as the western water hemp (*Acnida tamarascina*), however, the blue is confined to a small part of the pollen, showing quite distinctly from the remaining protein.

3. "Smooth pollen" in these cases would not be exact, as many of the unspiculated pollens have lines, grooves and other irregularities.

4. An instrument called the anemophilometer has been devised by this department in which the wind pollination of plants can be artificially tested.

5. With these exceptions, the cereals are not wind-pollinated and do not cause hay-fever. The rarity of corn as a cause of hay-fever is partly due to its being uncommon in the cities and suburbs, and partly to the size of its pollen (80 microns). Under the same conditions that the common ragweed pollen will be carried by the wind one-half mile, the corn pollen will travel only 43 feet. (From our table of potential areas of hay-fever plants.)

Negative Tests for Protein in Ragweed Pollens.—With spiculated pollens, the iodin tests have invariably been negative, indicating an inappreciable amount of protein. A large number of tests have been made with these pollens, as the primary irritation from the spicules did not preclude the possibility of a secondary reaction from protein. In every case, however, the iodin test gave a negative result.

All pollens are furnished with some means by which their ripened contents may be expelled. In most cases, this is accomplished by means of small holes, called "pores," through which the pollen tube, which is the development of the interior coat (intine) of the pollen, is projected for fertilizing the pistil, or fertile part of the flower. In other cases, small lids are pushed up by the pressure of the contained matter, and in others, the thinner walls allow the projection of the germinating tube.

In order to ascertain, however, that the iodin reaction is not interfered with by the coats of the ragweed pollens, some of these were crushed in order to express the fovilla, the protoplasmic contents of the pollen grain.

This, however, proved to be difficult on account of the high resistance of these pollen grains. While the grass pollens have so light a coat that they are frequently crushed in the ordinary process of mounting, the ragweed (ambrosias) pollen grains resist pressure between two glass slides carried to the point of crushing the glass. Eventually, the pollens were broken by forcibly rubbing them with the handle of an instrument, and even this resulted only in an occasional pollen grain being crushed. The iodin test was then again applied, but the expressed contents of the pollen showed no difference with the iodin test.

Fig. 2.—Unspiculated pollens of grasses (spherical) high in protein, and sedges (prismatic) low in protein.

Reagents for Glycerin Plates.—The iodin test forms a routine method in the examination of glycerin plates. These are placed in various localities and altitudes in order to ascertain the number and varieties of pollen present in the air. The iodin stains the glass pollen blue, the spiculated pollen yellow-brown, the pollen of low protein bluish-brown and the innocuous smooth pollens yellow-brown. As the glycerin plate is passed across the optical field by means of the mechanical stage, these stains greatly simplify the quantitative and qualitative count.

Two Forms of Active Pollen.—As the result of these investigations, we find that there are two forms of active pollens. The first and most important form is the spiculated pollen, low in protein, and the second, unspiculated pollen rich in protein. Other pollens without spicules and with but a small percentage of protein form a minor and less important division of the second class.

In the ragweeds (*Ambrosia elatior* and *trifida*), which are the cause of 85 per cent. of the autumnal and most severe form of hay-fever in the section of the United States east of Kansas,[6] the spicules are well developed. In the former (*Ambrosia elatior*), 15 microns in diameter, the spicules are 2 microns, and in the *Ambrosia trifida*, 20 microns in diameter, the spicules are 2.8 microns in length. The effect of these spicules is prompt, active reaction in a sensitive nostril. The severity and duration of this reaction depend on the degree of sensitiveness of the mucous membrane and the number of pollen grains inhaled. In most sensitive nostrils, the effect of the inhalation of from five to ten pollen grains will pass off in thirty minutes, but several hundred pollen grains, which form an almost invisible cluster, will cause a reaction lasting from one to fifteen hours.

In an atmosphere in which there are many pollen grains which are kept floating by means of the wind, enough are usually inhaled to prolong the attack until the end of the season, unless this is interrupted by a rain, destruction of the weeds producing the pollen, by removing the infected area, or by raising the resistance of the patient.

Increased Susceptibility Versus Anaphylaxis.—The increased susceptibility of the patient to pollen after the first inhalation of spiculated pollen is not due to anaphylaxis but to the increased sensitiveness of the nostril resulting from this irritation. The sensitiveness which causes him to react to the first pollen inhaled probably also persists and conduces to this susceptibility.

Influence of Size of Spicules.—In the cocklebur, which is next in importance to the ragweed of the spiculated pollen, the spicules are relatively and actually shorter than those of the ragweed pollens, being 0.7 microns in length, the shorter length resulting in a much less pronounced reaction and one of shorter duration. The less extended distribution of the cocklebur, as compared with the ragweed, also makes it of less importance than the ragweeds, except in sections in which the cocklebur is found but not the ragweed. In some of these places the development of hay-fever followed the advent of the cocklebur.

The small number of cases due to the cocklebur also results from the large size of this pollen. It is 36 microns in diameter as compared with the 15 microns of the common ragweed. The result of this is that the pollen of the cocklebur will be carried on level ground 700 feet in a wind of 20 miles an hour, while the ragweed under the same condition will be carried 3,015 feet.[7]

The marsh elder (*Iva ciliata*) also has a spiculated pollen grain whose length is much shorter than those of the ragweed, being 0.5 microns in length. As with the cocklebur, the reaction on this account is less

6. West of Kansas the ragweeds are replaced by the Iva xanthafolia, called the giant ragweed, and the western ragweed (*Ambrosia psilostachya*).

7. A table giving the distances that wind-borne pollens will be carried by winds of different velocities will be given in another report.

marked and prolonged than the ragweeds. Its distribution is still less extended than that of the cocklebur, and this plant is therefore of less importance in connection with hay-fever. From the Dakotas to Nebraska, New Mexico and California, this is represented by the *Iva axillaris* (small flower marsh elder, or poverty weed), in which territory it forms an important cause of hay-fever.

Spiculated Pollen in Non-Wind-Pollinated Plants.—There are many plants which have spiculated pollen, but, not being wind-pollinated, do not cause true hay-fever in the sense that the pollen is inhaled naturally from the atmosphere. As these will, however, cause an acute attack if applied directly to the nostril, as sometimes happens in children, a large number of these have been tested.

Among these is the common sunflower (*Helianthus annuus*, Fig. 3), which has large spiculated pollen grains (40 microns), the spicules being 5.6 microns. On account of the size of the spicules, it gives a violent reaction. The sunflower, however, while apparently giving a great deal of pollen, is insect-pollinated and gives little pollen as compared with the real wind-pollinated plants, such as the ragweeds (*Ambrosia elatior* and *trifida*), careless weed (*Amaranthus spinosus*), cocklebur (*Xanthium americanum*), etc. Its large size also further reduces its potential radius, so that it is not a frequent cause of hay-fever.

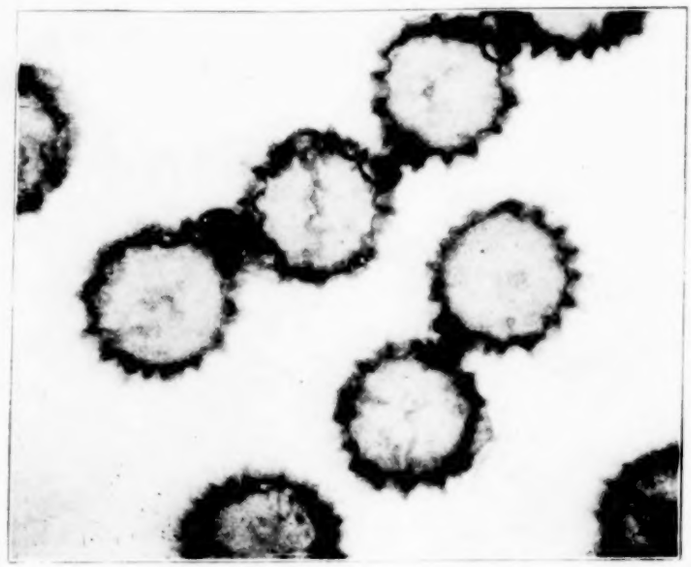


Fig. 3.—Pollen of sunflower (*Helianthus annuus*). The long spicules (5.6 microns) produce a violent reaction, but the flowers are not wind-pollinated.

Among the other plants, with spiculated pollens, which will cause a reaction only by direct inhalation, are: golden rod (*Solidago odorata* et al., 25 microns), iron weed (*Vernonia noveboracensis*, 40 microns), rosin weed (*Grindelia squarrosa*, 20 microns), horse weed (*Erigeron canadensis*, 20 by 24 microns), marshmallow (*Hibiscus palustris*, 170 microns), sow thistle (*Sonchus asper*, 30 microns), dandelion (*Leontodon taraxacum*, 46 microns), sneezeweed (*Helenium tridentatum*, 25 microns), Shasta daisy, 50 microns, mayweed (*Anthelmis cotula*, 20 by 25 microns), and black-eyed Susan (*Dracopix amplexicaulis*, 25 by 30 microns).

Each of these pollens has proved positive in the biologic test. The anemophilometer, however, shows that the pollen does not leave these plants at all (rosin weed,[8] etc.) in a wind of from 10 to 20 miles an hour, or not in sufficient numbers to be of importance in hay-fever (sneezeweed, *Helenium quadridentatum*).

Influence of the Extine.—The character of the extine of the pollen also has an important bearing in protein absorption. In the spiculated pollen, probably for the support of the projections, the extine is dense. It is so strong that it can be broken only with the greatest difficulty. This is also the case with the pollen of the sedges, which is markedly cuticular, possibly for the purpose of conserving the moisture in these pollens.

In the grasses (*Gramineae*), however, the extine is so light and friable that the slightest pressure causes the contents (fovilla) to be discharged. Even, therefore, if the spiculated pollen and sedge pollen had a large amount of protein, the density of the extine would inhibit to a large extent the absorption of their contents. As has already been explained, the contained protein is extremely low and negligible.

Potential Area of the Grass Pollens.—The grass pollens have a marked uniformity in the amount of protein and in the corresponding reaction. The number of cases from any special grass corresponds with the prevalence of these grasses. In some sections, the bull grass (*Paspalum dilatum*) is the most frequent cause, in others, the timothy (*Phleum pratense*) or the meadow grass (*Poa trivialis*), the number of cases corresponding with the prevalence of these grasses as demonstrated by the exposed glycerin plates.

When a large variety of grasses are pollinating, the potential area of the various pollens is influenced by the size of the grains. Most of the grass pollens are large as compared with the ragweed pollen, the average being about 40 microns in diameter. This varies, however, from the dwarf meadow grass (*Poa annua*), which is one of the smallest noted (7 microns) to the yellow foxtail grass (*Chaetochloa glauca*), which is 55 microns in diameter. The result of these extreme differences in size is that the meadow grass on level ground travels 3,000 feet in a wind of 10 miles an hour, while the foxtail grass will be carried only 62 feet under the same conditions. On account of the greater size and smoothness of these pollens generally and the smaller number of grains discharged, the potential area of grasses is much less than that of the ragweeds.

TREATMENT

While the treatment based on these investigations is still under consideration, and does not form a part of this report, a few suggestions at this time may be of advantage.

The special object in the treatment is to increase the patient's resistance to hay-fever and the elimination or decrease of the infecting pollens. In the former, the general condition of the patient should, of course, be considered, but exercise in an infected atmosphere should be avoided. Nasal irregularities which cause a concentration of pollen in either nostril should be corrected as a prophylactic, but not a

8. The rosin weed (Grindelia squarrosa) is generally supposed to be the cause of hay-fever in Wyoming and the surrounding territory. Its pollen is spiculated but not wind-pollinated, and is therefore not the cause of hay-fever.

curative measure. Sprays with an oil of low specific gravity (0.850) are of special benefit in autumnal hay-fever, as the oil softens the spicules of the pollen and diminishes their irritation. Menthol and other drugs in this oil are to be avoided, as they are of little benefit and limit the free use of the oily spray.

Reduction of Infected Area.—The cutting of the weeds in the neighborhood of the patient's residence is of the first importance. In a neighborhood in New Orleans, the cutting of the weeds in one neglected square resulted in four known hay-fever patients in this immediate neighborhood being entirely without hay-fever the following season.

In the treatment of hay-fever, the patient is first given a glycerin plate to collect the infecting pollen for identification, and to determine whether it is spiculated or unspiculated. An inspector is then sent who makes a "thirty-six square inspection," which includes three squares in each direction from the residence of the patient. In most cases examined thus far, the infecting weeds were found in this survey. The lots having neglected grass and weeds are then reported to the health officer, who files affidavits for violations of the grassweeds ordinance.

These suggestions regarding treatment have given uniform satisfactory results, a full report of which will be given at the end of the season.

CONCLUSIONS

There are two forms of pollen causing hay-fever, the first, spiculated in form and low in protein, causing direct hay-fever; the second, unspiculated in form and high in protein, causing hay-fever by absorption of the protein (indirect hay-fever).

In direct hay-fever, the severity of the attack and its duration depend on the number of pollen grains in the atmosphere, and the length of the pollen spicules. The ragweeds form the type and the principal cause of this form of hay-fever.

In indirect hay-fever the severity of the attack and its duration depend on the amount of protein contained in the pollen and on the number in the atmosphere. The grass pollens have the highest percentage of protein, and form the type and the principal cause of this form of hay-fever.

Pollens without spicules and with an inappreciable amount of protein are innocuous in hay-fever.

The Field of Chemistry.—Modern chemistry has had a manifold origin and tends toward a many-sided destiny. Into the fabric of this science men have woven the thought of ancient Greek philosophers, the magic of Arabian alchemists, the practical discoveries of artisans and ingenious chemical experimenters, the doctrine of physicists, the stern and uncompromising logic of mathematicians, and the vision of metaphysical dreamers seeking to grasp truths far beyond the reach of mortal sense. The complex fabric enfolds the earth—indeed, the universe—with its far-reaching threads. —T. W. Richards, Ideals of Chemical Investigation.

BRACHIAL PLEXUS SURGERY*

ARTHUR AYER LAW, M.D.
Fellow of the American College of Surgeons; Associate Professor of Surgery, University of Minnesota Medical School
MINNEAPOLIS

The present European war, with its colossal total of wounds, many of which inevitably involve the peripheral nerves, has aroused an added interest and stimulated additional research in the surgery of this system.

Brachial plexus injuries in the adult, aside from those resulting from gunshot or stab wounds, or secondary to skeletal injuries, are rare, as was shown in 1911 by Frazier and Skillern,[1] who were able to collect reports of only twenty-one cases which had been verified by operation. Anatomically the brachial plexus, located almost subcutaneously in the root of the neck and unprotected by the skeleton, is vulnerable to direct injury. Direct trauma used to be considered the most frequent cause of injury to these nerves until experimentation by Horsley[2] and Taylor,[3] and a closer study of etiologic mechanics convinced observers that injury of the plexus did not frequently result from pinching them between the clavicle and first rib, but rather from their forcible avulsion, which tore the cords out by the roots, in the intravertebral and intervertebral cases, and ruptured them anywhere between the spine and axilla in the supraclavicular or infraclavicular types.

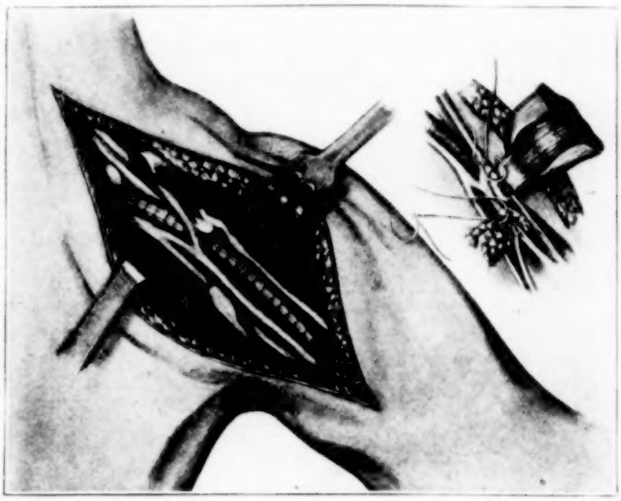


Fig. 1 (Case 1).—Avulsion of musculocutaneous and musculospiral nerves. Inset shows end-to-end and end-to-side or crossed anastomosis.

The relatively large number of so-called cases of "birth palsies" in infants, which at present are being reported, lend confirmatory evidence that avulsion of the brachial plexus trunks comes from indirect violence, for here the upper cords of the plexus are torn asunder or out of the foramina themselves, by extreme traction of the shoulder away from the head in the birth of the child. When the lower cords are injured, this results from breech presentations in which the arm is stretched up over the shoulder and the lower cords are put severely on the stretch, probably over the head of the humerus. Again, there are the reported cases in adults when heavy objects like trees or timbers fall on the shoulder and pull it away from the neck, as in Murphy's case;[4] or when men are thrown onto their shoulders, violently separating the neck from the shoulder as in Peck's case;[5] or in falling from a height and clutching at something to break their fall, their arm is violently abducted and

* Read before the Section on Surgery, General and Abdominal, at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Frazier, C. H., and Skillern, P. G.: Supraclavicular Subcutaneous Lesions of the Brachial Plexus Not Associated with Skeletal Injuries. THE JOURNAL A. M. A., Dec. 16, 1911, p. 1957.
2. Horsley, Sir Victor: Practitioner, London, 1899, lxiii, 136.
3. Taylor, R. W.: Med. News, 1905, lxxxvi, 1013.
4. Murphy, J. B.: Surgical Clinics, 1912, i, 339.
5. Peck: Ann. Surg., 1911, liii, 858.

pulled above the head, as reported by Brislow;[6] or, as happened in both of my cases, the patient's arms are caught in belts and they are pulled into and whipped forcibly over pulleys, the arms being jerked away from the bodies, and in one instance the man being thrown heavily against a post, striking on the root of his neck. All of this accumulated evidence disproves the theory of direct violence.

Successful surgery of the brachial plexus, as of any of the peripheral nerves, is dependent on the application of our present day relatively exact knowledge of the phenomena of regeneration in the peripheral segments of severed spinal nerves, which occurs when that segment is united to the viable central segment, and furthermore on an appreciation of the property which nonmedullated neuraxons have of projecting themselves through space and reaching across a gap separating the severed nerve stumps, when properly guided and conducted by some method of tubulization, preferably of fascia, as in my[7] case in which the musculospiral nerve completely regenerated across a space of 3 inches through a fascia lata tube. Lewis'[8] recently reported observations as to how the nonmedullated neuraxons are conducted by and follow protoplasmic bands, which span this gap and originate from both stumps, are added evidence which opens up a fascinating realm of surgical opportunity and offers relief in the class of cases which have heretofore been considered hopeless.

After the severance of a nerve, both stumps undergo neuromatous degeneration, and scar tissue infiltrates the retracted clubbed ends and for a greater or less distance invades the nerve trunks. Serial sections of these clubbed ends ultimately expose the brush ends of the nerve fibers. If, then, these exposed and cleanly cut across fibers are approximated end to end and protected from the ingrowth of connective tissue by wrapping the union with a fascial or fat flap, we expect complete regeneration of the peripheral nerve, provided the central ganglionic cells are intact.

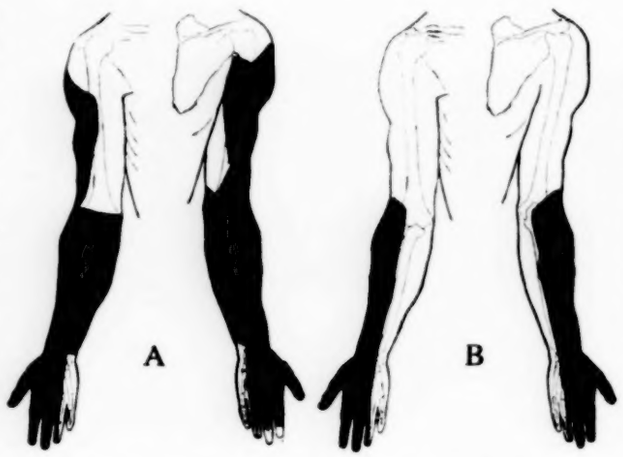


Fig. 2 (Case 1).—Dark areas indicate extent of anesthesia: *A*, before operation, and *B*, thirteen months later.

It is illuminating to know that it is entirely possible to make one highly specialized motor nerve carry impulses to a paralyzed group of muscles served by another injured or degenerated nerve, provided the paralyzed peripheral nerve segment is anastomosed with the proximal segment of the healthy nerve. This restoration of function is possible through a reeducation of the cortical centers (adjacent to or remote from one another) which enables them to meet the needs and respond to the peripheral necessity. Much research by many observers has clinched the conviction that this reeducation is entirely feasible, as is shown in the observations of Flourens[9] on the crossed anastomosis of the brachial plexus in cocks, those of Rawa[10] on cats, and of Kennedy[11] and Murphy[12] on dogs, most of these observers reporting practically perfect results. Schiff[13] crossed the hypoglossal and vagus nerves and found return of motion in the muscles of the tongue. In the experimental surgical laboratory of the University of Minnesota, Dr. Corbett and I cross anastomosed the various nerves of the brachial plexus in five dogs, wrapping the line of union with fascial flaps or vein cuffs. So perfect was the reeducation that at the end of five months it was difficult to determine which side had been operated on.

The clinical application of these laboratory findings has yielded excellent results, as demonstrated by the spinofacial and spinohypoglossal anastomoses, as originally suggested by Ballance and Stewart,[14] and carried out so successfully by Cushing[15] and other surgeons. Here restoration of function of the muscles of facial expression is more or less perfectly accomplished by reeducation of the brain centers; until that occurs and sometimes permanently, associated movements of the shoulder and face or of the face and tongue persist. Grant's[16] remarkable result following spinofacial anastomosis, with the attendant anastomosis of the distal accessory fragment to the descendens hypoglossi, opened a new field of endeavor, for here the motor nerves arising from the first and second cervicals and running in the sheath of the hypoglossal with their centers were reeducated to control the trapezius and do away with associated shoulder and face movements.

The success of these anastomoses and the reported success of the anastomoses between the anterior tibial and musculocutaneous nerves by Spiller and Frazier[17] and Young,[18] and between the external and internal popliteal by Murphy[19] and Kader[20] in cases of infantile paralysis, give more than enough evidence to warrant the expectation of more or less perfect restoration of function, whether the nerves crossed be a part of the brachial or lumbar plexus or any of the peripheral nerves of highly specialized function.

Nerves which are forcibly avulsed are injured in a vastly different manner than those which are deliberately or accidentally cut cleanly across by a sharp instrument. In the avulsed trunks the bundles of neuraxons are torn at different levels and are frayed and pulled apart and severely traumatized, the endoneural blood vessels are torn, hemorrhage occurs in the sheath, and this with the trauma of the accident and the hemorrhage about the nerves results in the

6. Brislow, A. F.: Ann. Surg., 1902, xxxvi, 411.
7. Law, A. A.: Some Modern Phases of Neural Surgery, St. Paul Med. Jour., September, 1915.
8. Lewis, Dean: Tr. Am. Surg. Assn., May 9, 1916.
9. Flourens: Recherches expérimentales sur les fonctions du système nerveux, 1824, p. 272.
10. Rawa: Arch. f. Physiol., 1864, p. 421.
11. Kennedy, Robert: Phil. Tr. Roy. Soc. London, 1901, Series B, cxciv, 127.
12. Murphy, J. B.: Surg., Gynec. and Obst., 1907, iv, 454.
13. Schiff: Arch. d. sc. phys. et nat., Geneva, 1885.
14. Ballance and Stewart: Brit. Med. Jour., May, 1903.
15. Cushing, Harvey: Ann. Surg., May, 1903.
16. Grant, W. W.: Traumatic Facial Paralysis, THE JOURNAL A. M. A., Oct. 22, 1910, p. 1438.
17. Spiller, W. G., and Frazier, C. H.: The Treatment of Acute Anterior Poliomyelitis by Nerve Transplantation, THE JOURNAL A. M. A., Jan. 21, 1905, p. 169.
18. Young, J. K.: Internat. Clin., iv, Series 14, p. 154.
19. Murphy, J. B.: Surg., Gynec. and Obst., 1907, iv, 470.
20. Kader: Chipaults état actuel de la chirurgie nerveuse, ii, 202.

secondary formation of scar tissue, either in the nerve sheaths themselves or about them. Later, scar contraction results in multiple neuromatous nodules of the trunks, which prevents the projection of the proximal axones into the distal segments, or the contraction of the perineural connective tissue strangulates the fibers to the extent of partially or wholly interfering with conduction, which inevitably is followed by trophic changes and motor and sensory paralysis.

One type of injury or neuritis which has been thoroughly studied by surgeons and neurologists is that caused by pressure on the lower cords of the brachial plexus by supernumerary ribs. This results in a pinching of the nerves in the angle formed by the scalenus anticus muscle and the cervical rib, this pinching being accentuated by the constant hammering from respiratory movements. A phase of this type of injury which seems to have escaped attention is caused, not by an adventitious rib, but by a supernumerary band or ligament taking the place of the rib and springing from the seventh cervical transverse process, projected forward and inserted either into the first rib with the scalenus anticus, as occurred in one of my cases, or into the interclavicular ligament, as happened in the other.

In both of my cases at operation, accessory ribs were absent. The seventh cervical transverse processes, however, seemed in the roentgenograms to be drawn down closer to the first dorsal transverse process on the affected side. In both instances these ligaments were extremely taut, and tightly stretched over them and sharply angulated were the eighth cervical and first dorsal cords of the brachial plexus, the tension on which was immediately relieved when the ligaments were cut. This condition gave the typical peripheral symptoms in the hand, which are so characteristic of cervical ribs and the coincident brachial neuritis. In one of these cases, the trophic changes in the phalanges of the middle finger on the affected side were interesting to note. Comparative roentgenograms of both hands showed marked rarefaction of these bones, which was apparently identical with the picture of disuse atrophy.

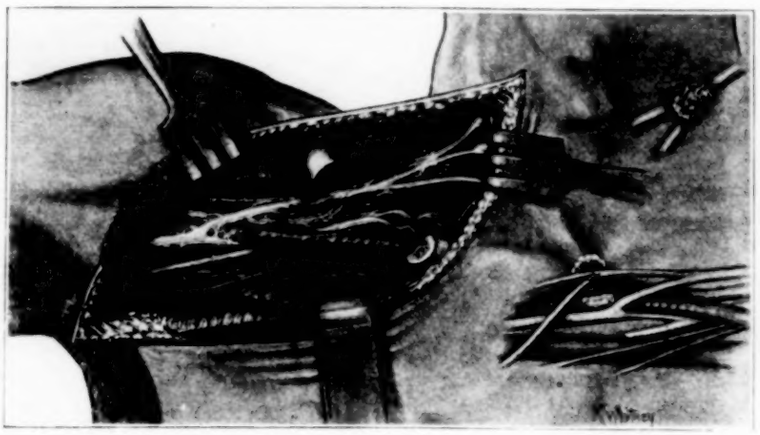


Fig. 3 (Case 2).—Avulsed nerves of brachial plexus, neuromatous nodules and scar tissue about plexus. Insets show transposition, suture and wrapping of the line of union with free fascial flaps.

Symptoms of brachial plexus injury or rupture are of course dependent on where the cords are injured. In the upper arm or "Erb-Duchenne" type, this injury generally occurs to the fifth and sixth branches proximal to the origin of the suprascapular nerve, and therefore the supraspinatus and infraspinatus are paralyzed. The characteristic atrophy of these muscles occurs along with inward rotation of the shoulder and arm until the hand and forearm is in extreme pronation. Winging of the scapula when the arm is held horizontal and pushed on is shown when the injury is high enough to be above the origin of the long thoracic nerve, and is caused by paralysis of the serratus magnus muscle. Coincident with the paralysis of the shoulder girdle may be paralysis over the distribution of the posterior cord arising from the seventh cervical with branches from the fifth and sixth. Here, of course, the deltoid, biceps, coracobrachialis, triceps, brachialis anticus, supinators of the forearm and extensors of the wrist and fingers may be involved.

In the "Klumpke" or lower arm type, the eighth cervical and first dorsal branches are involved, and the symptoms are manifested in the areas supplied by the median ulnar, cutaneous and lesser internal cutaneous nerves, while the enervation to the upper arm and shoulder may be intact. This type is more uncommon than the former, and is liable to be accompanied by injury to the sympathetic system owing to loss of the celiospinal fibers which join it, coming from the first and second dorsal nerves and occasionally from the eighth cervical.

Injury to these fibers results in a typical series of symptoms, namely, narrowing of the palpebral fissure, or pseudoptosis, from paralysis of the nonstriated muscle fibers of Muller[21] in the upper lid, and enophthalmos, or sinking of the eye from paralysis of the nonstriated microscopic muscle fibers, described by Landstrom,[22] which are found in the fascia behind the eyeball and attached to the capsule of Tenon: also a contraction of the pupil on that side due to predominance of the motor oculus. Anhidrosis of this side of the face and neck may be observed from loss of sympathetic control of the sweat glands. These symptoms are generally an indication of an intradural avulsion.

In the cases in which all the cords have been avulsed high within the dura or foramina, the persistence of sensation on the inner side of the upper arm is explained by the loops of communication between the nerves of Wrisberg and the intercostohumerals with the first, second and third intercostal nerves, which cannot be injured by avulsion.

In addition to the twenty-one cases of avulsion in adults verified by operation and collected up to 1911, we have found two other cases reported by Hartwell[23] and Murphy.[4] These with my own two cases with operation swell the total to twenty-five. These injuries in adults are so rare that it is not given to any one surgeon to see a large series. Therefore I am constrained to report my cases somewhat in detail:

REPORT OF CASES

CASE 1.—G. H., man, aged 23, Dec. 5, 1914, while working in a flour mill, got his left arm caught in a large belt which picked him up and whipped him over a pulley before he was thrown off. This injury resulted in an immediate paralysis of all extensors of fingers and wrist, and of the supinators and the triceps. The biceps, coracobrachialis and brachialis anticus were paralyzed as well. Anesthesia existed on the

21. Muller: Ztschr. f. Zool., 1858; Worzb. Verhandl., 1859.
22. Landstrom: Ueber Morbus Basedowii, 1907.
23. Hartwell, J. A.: Ann. Surg., 1914, lx, 516.

anterior and posterior aspects of the upper arm from the middle of the deltoid to and including the elbow and over all of the forearm and hand, save on the ulnar side of the hand from the midline of the ring finger, front and back, and extending up to the wrist. There was sensation over the first phalanges of the first, second and third fingers on the dorsum. There was sensation on the inner side of the upper arm, beginning 2 inches above the elbow. The shoulder girdle was intact with the exception of the deltoid, which was

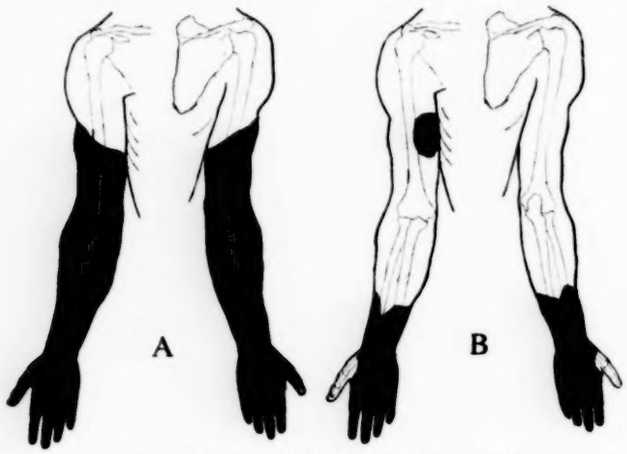


Fig. 4 (Case 2).—Dark areas indicate anesthesia: *A*, before operation, and *B*, four months later.

paralyzed. This injury, then, was of the mixed type, and obviously involved the musculocutaneous below the outer head of the median, and the musculospiral above the origin of the circumflex.

There were no symptoms of sympathetic involvement, and all the muscles involved showed the reaction of degeneration prior to operation. April 29, 1915, or four and one-half months after the injury, the clavicle was sawed in two and an anatomic dissection of the brachial plexus made. This revealed a tortuous neuromatous scar of the musculocutaneous nerve, beginning just distal to the outer head of the median. The proximal stump of the musculospiral could not be recognized, and the distal stump was clubbed and retracted 3 inches from its normal origin. All other cords and their branches, save the musculocutaneous and musculospiral, responded normally to a faradic exciter. The neuroma of the musculocutaneous was resected by serial sections for 3 cm. until the normal fasciculi of both stumps were determined, when the stumps were approximated with fine chromic gut sutures. The line of union was then wrapped with a pedicled fascial flap from the stump of the pectoralis major. The clubbed distal end of the musculospiral was resected and this nerve implanted by end-to-side anastomosis into a slit in the side of the median nerve and anchored there with chromic gut, the line of union being wrapped with a pedicled flap of axillary fat. The sectioned clavicle was drilled and united with kangaroo tendon.

Now, thirteen months later, by reeducation, this man has nearly a normal return of all of the functions of the deltoid, coracobrachialis, biceps, brachialis anticus and triceps; he can extend, supinate and pronate the forearm fairly well, flex the wrist very well, and he flexes the second, third and fourth fingers well, the index finger very slightly, and the thumb not at all. The wrist extensors are but feebly functionating, and those of the thumb and index fingers not at all. Those of the last three fingers show about 75 per cent. of function. Sensation has returned save over the radial half of the forearm and hand, or corresponding to the distribution of the muscle spiral, musculocutaneous and radial nerves. The trophic changes in the limb show a marked improvement, save in the thumb and index finger. From an arm that was worthless this man now has a limb which, although it is far from normal, is extremely useful, and which in view of the fact that it frequently takes many months or even years completely to regenerate and reeducate nerves, gives promise of still further improvement. Should the function of extension of the wrist not return, we shall ultimately transplant the tendon of the flexor carpi radialis into the common extensor tendons.

Case 2.—A. W., man, aged 42, Dec. 23, 1913, while working in the flour mills, had his right arm caught between a belt and pulley, and he was thrown violently, striking a post with the root of his neck. There was immediate paralysis of his entire right arm and shoulder girdle, together with right sided enophthalmos, pseudoptosis and contracted pupil, indicating involvement of the sympathetic or ciliospinal fibers. The trapezius, levator anguli scapulae and rhomboidei were functionating: the serratus was paralyzed, but the pectorals were feebly acting. Sensation was lost from 3 inches below the axilla.

From these observations we concluded that all the cords of the brachial plexus were involved and that the lesions were high up, as the suprascapular and long thoracic nerves were injured as were the sympathetic fibers in the eighth cervical and first dorsal roots.

At operation, Feb. 1, 1916, after the splitting of the clavicle, an anatomic dissection of the brachial plexus was made, and revealed that all of the cords were bound down by scar tissue near the middle of the plexus, that the first and second cords just after they emerged from the foramina showed definite neuromatous nodular enlargements, and that the eighth cervical and first dorsal nerves were buckled on themselves and relaxed, although they still were adherent by connective tissue to the foramina.

After all scar tissue about the plexus was dissected off faradic stimulation of the various cords revealed a slight response from the muscles supplied by the suprascapular and musculocutaneous nerves, slight from the musculospiral and median but none at all from the ulnar nerve. Apparently the roots of the eighth cervical and first dorsal were torn off the cord, while all the other nerves had conduction interfered with by scar tissue either within or without the sheaths. The ulnar nerve was sectioned high, and by the end-to-

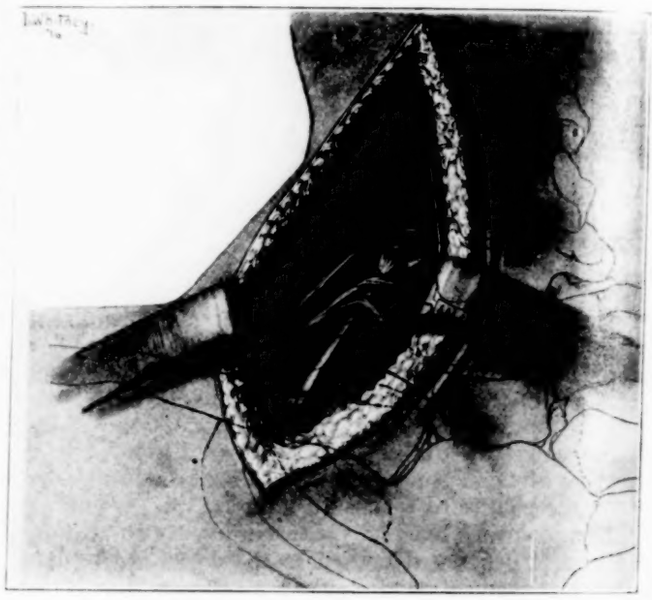


Fig. 5 (Case 3).—Adventitious ligament taking the place of a cervical rib; brachial plexus stretched over it.

method united to a notch in the musculocutaneous, that being the trunk giving the greatest faradic response, and the line of union was wrapped with a free fascial flap. The entire brachial plexus was then covered by a pedicled flap of axillary fat to prevent reformation of scar tissue. Now, four and one-half months later, the trophic improvement in the limb is marked, sensation has returned in the arm and forearm down to within 2 inches of the wrist, and there is also sensation in the thumb.

There is slight voluntary action of the biceps, triceps and deltoid muscles, and there is feeble extension of the wrist. This man's injury was so high and so extensive that there is no certainty of great improvement; yet the amount of regeneration to date is significant.

CONCLUSIONS

While none of the reported cases of avulsion in the adult in which operation was performed showed complete recovery, still enough function was regained to justify interference. Such interference should include nerve transposition when indicated, our warrant being the clinical and experimental evidence, which has proved the certainty of reeducation.

420 Syndicate Building.

ABSTRACT OF DISCUSSION

DR. DEAN D. LEWIS, Chicago: Surgery dealing with injuries of the peripheral nerves has been far from satisfactory. If we look over statistics dealing with a large number of cases of peripheral nerve suture we will be surprised to find that only about 36 per cent. of them can be regarded as distinct successes. It is also surprising to find that secondary nerve suture gives about the same results as primary. I believe that failure in peripheral nerve suture is often due to the fear of removing a sufficient length of the nerve to get well beyond the scar tissue, so that healthy axis cylinders are exposed which is essential to success. Studies on peripheral nerve regeneration have shown the marked ability of the fibers to regenerate. Regeneration of the axis cylinders is preceded by protoplasmic band formation which takes place from both ends of the divided nerves. These bands form conducting paths for the developing axis cylinders. I believe that fascia is the best material for tubulizing divided nerves. In some experimental work which Dr. Kirk and I did, we found that fascia is better than blood vessels for this purpose. The developing axis cylinders readily invade the serum in such a tube and the use of agar, as recently suggested by Edinger, does not seem necessary. An autotransplant gives the best results, as determined by histologic studies, and the method of nerve transference recently suggested by Hofmeister seems to be a distinct advance in this class of work. Dr. Law is to be congratulated on the results he has had in these two cases because the technic required in dealing with injuries of the brachial plexus is difficult, and consequently the functional results are often disappointing.

DR. ARTHUR A. LAW, Minneapolis: We did some experiments at the University of Minnesota to disprove the theory of positive neurotropism that Forsman brought out. It did not seem like good pathology. In a series of animals we sectioned the musculospiral nerve and avulsed the distal segments so they could exert no attraction for the proximal segment. We then inserted the proximal nerves into little fascial bags and stitched them there. We found that this little fascial sac ultimately was filled with nerve fibers, notwithstanding that they lacked the influence of chemotropism of the distal fragments.

Longevity and Race.—There is reason to believe that certain races live longer than others, and undoubtedly inhabitants of temperate climates live longer than tropical races. Humphry pointed out that old age is a product of civilization because the savage when his strength decays cannot live. Moreover, civilization provides pensions for those who are too old to work, and by the cultivation of the humaner feelings has made the maintenance of the aged a duty which is generally cheerfully performed. But the savage is free from most of the diseases which attack civilized man, and consequently that state of society in which there is enough civilization to temper the lot of the aged and not enough to corrupt the young is the most favorable for the attainment of a long life.—Saundby.

THE INTEREST OF THE COMMUNITY IN CANCER *

LOUIS I. DUBLIN, PH.D.
Statistician, Metropolitan Life Insurance Company
NEW YORK

The interest of the community in cancer can best be characterized, perhaps, by contrasting this disease with another that is still more familiar, namely, tuberculosis. The average age at death from tuberculosis is about 37 years; from cancer it is about twenty years greater. Tuberculosis affects primarily the economic interest of the community. The decedent is usually at the highest point of his efficiency; his productive period is still largely in the future; his children are either very young or still unborn. In cancer, on the other hand, the productive period is for the most part in the past; the children have been born, and the family unit is only slightly disturbed economically by the death, since in the majority of cases the offspring have reached the age of self-support and independence. It is, therefore, the emotional interest that is uppermost. The long suffering patient, and the utter hopelessness of the condition in its advanced stages, appeal tremendously to the humanitarian feeling of the community. The economic interest in cancer, although important, must remain secondary.

Our interest is accelerated by the mystery that still surrounds the disease. The prevalence of cancer has been noted in the earliest history of civilized man. Today it is responsible for one death out of every fourteen among men, and for one death out of every nine among women, after the age of 50. Yet, in spite of the wealth of clinical material and the concentration of effort, it has withstood every attempt of the physician and scientist to unravel its secret. The world is still baffled as to the cause of cancer. Only a beginning has been made in its study; the heart of the problem is still sealed to us. The scientific spirit of present-day medicine demands an explanation, and the community as a whole supports this demand insistently and wholeheartedly.

Additional interest results from the disquieting fact that the cancer rate may be increasing. The chief sources of information on their face indicate an increase. This holds true not only for the Registration Area of the United States and for those of our states whose records are most reliable, but also for the United Kingdom, for Switzerland, for Germany and, indeed, generally throughout the civilized world. I shall not go into the complex statistical problem involved in determining whether this increase is real or only apparent. Equally good authorities have divided on this important question. My own judgment is that there may very well be an increase. I am struck, however, with the number of possibilities of serious error in using figures which are usually quoted to prove an increase, especially in our own country. The figures are too striking to be true. In the ten-year period from 1901 to 1910, there was an increase of 30 per cent. in the male cancer rate, and of 22 per cent. in the female cancer rate, at all ages beginning with the age of 25, in the state included in the Registration Area in 1900. At certain age periods this increase was very considerable—as much as 40 per cent. The unreliability of these figures is at once apparent when we think of cancer as

* Read before the New York Academy of Medicine, in association with the American Society for the Control of Cancer, May 18, 1916.

a disease of long standing in our civilization. By projecting such increases in the rates forward or backward a few generations, we are led at once to an absurdity; for if cancer were capable of increasing at such a pace it would either have been a negligible disease in the recent past or would seriously threaten the very existence of the race in the near future.

We must consider, in seeking for an explanation of the increasing rates, first, the marked improvement of registration in general in our country during the last fifteen years, and second, the greater certainty in the diagnosis of cancer by physicians, which has resulted from the increase in the number of operations and laboratory examinations. We shall have to wait at least ten years under present conditions of registration in our country to know definitely what has happened. There are already indications that the cancer rate has reached its highest point, and that in certain communities it is beginning to decline.

But whether or not cancer is on the increase is really secondary to the much more important fact that the rate at present is extremely high. The condition today is a real menace. In order that we may determine the extent of the problem that is before us, it is necessary to refer to a few basic figures. The accompanying tables are constructed from the experience of the Industrial Department of the Metropolitan Life Insurance Company. They are valuable because of their intrinsic accuracy, a quality which most cancer rates, unfortunately, do not possess. The figures have also the merit of being based on a large exposure. In the Metropolitan experience there are represented over 10,000,000 persons, both white and colored—men, women and children of all ages above 1. The number of persons exposed and the corresponding number of deaths are known with a high degree of accuracy. The rates have furthermore the particular value of applying to the working classes of the United States and Canada.

TABLE 1.—DEATH RATES FROM CANCER (ALL FORMS) PER HUNDRED THOUSAND EXPOSED, CLASSIFIED BY COLOR, SEX AND AGE PERIOD*

Age Period	All Persons	White Males	White Females	Colored Males	Colored Females
All ages	69.7	49.9	88.4	30.0	87.5
1- 5	4.2	4.1	4.4	2.9	2.9
5- 9	1.5	1.6	1.7	0.5	0.5
10-14	1.3	1.5	1.2	0.5	0.9
15-19	2.7	2.6	2.9	1.9	3.1
20-24	4.2	4.6	3.9	1.5	5.3
25-34	15.9	8.2	19.0	8.1	33.6
35-44	77.0	38.1	100.8	27.9	121.8
45-54	198.8	141.0	240.7	92.7	247.9
55-64	381.9	361.4	420.6	174.6	354.6
65-74	603.1	600.6	656.6	213.8	431.0
75 and over	817.5	815.2	862.0	308.0	680.1

* Metropolitan Life Insurance Company—Industrial Department—mortality experience, 1911-1914.

The first column in Table 1 shows the death rates from cancer for all persons, without distinction of sex or color. The rate at all ages is 69.7 per hundred thousand exposed. This rate is based on a total of 23,660 cancer deaths which occurred in the four years 1911 to 1914. In the remaining columns, rates for white and for colored persons of each sex are given.

Without devoting attention to the numerous interesting aspects of this table, I may nevertheless point out a few striking derivations. First, the cancer rate is much higher among females than among males. Second, the rate begins to be significant only with the decade from 25 to 34. Third, the rates are lower for colored than for white persons; however, this applies much more to males than to females. At ages 25 to 34 the rate per hundred thousand for white males is 8.2, and thereafter it increases very rapidly, reaching its maximum, 815.2, at ages 75 and over. White females have a rate of 19.0 at ages 25 to 34—more than twice as much as the corresponding figure for males. As the curve rises there is a tendency for the differences between the sexes to become less, so that in the last age class the rate for white females is 862.0—only a slight percentage in excess of the corresponding figure for males. Colored males uniformly show the lowest rates of the four classes. In the first significant age class they have a mortality of 8.1. With advancing years the difference in their favor becomes greater, so that in the last age class they exhibit a rate of only 308.0—less than half that of the next higher class. Colored females show a very high mortality in the early significant age classes. At 25 to 34 they have a rate of 33.6, almost twice that of white females, and more than four times that of white males. In the later age classes, however, this disadvantage disappears, so that at ages 75 and over they have a mortality of only 680.1 less than that of both classes of whites.

It has often been said that cancer is a disease of the well-to-do. If our figures show anything it is that the industrial classes enjoy no advantage. The rates which I have just quoted indicate this point clearly on comparison with those for the Registration Area, which embraces all classes of the population. The rates for the various age groups of the white male industrial population uniformly exceed by 10 per cent. or more the corresponding figures for the population as a whole; the rates for the female industrial population fluctuate about the corresponding figures for the Registration Area, being sometimes a little above and sometimes a little below. To be sure, this may be due to the greater accuracy of the insurance data. Be that as it may, we can distinctly state that no large groups in the community enjoy any special immunity. This has been confirmed by an investigation which I have recently conducted into the mortality rates of the principal races of our population. I have found that there is little to justify assertions which have been made in the literature that certain of the races enjoy especial or partial immunity. The Jews, for example, have been singled out in this respect. As a matter of fact, the rate for Jews is sometimes higher than for the native-born Americans of the corresponding age periods. In 1910, for example, there was a cancer mortality of 150.0 per hundred thousand at ages 45 to 64, among the native American male population of New York State. On the other hand, the Russian-born male population—an overwhelming majority of which are Jews—had a rate of 277.5 in the same age class.

In Table 2, I have attempted to indicate the relative importance of the several forms of cancer which occur among males and females of the two races. It will be noted that among white males about half of the cancers affect the stomach or liver. About 20 per cent. more relate to other parts of the digestive system, namely, the buccal cavity, the peritoneum, the intestines or the rectum. Together over 70 per cent. of the cancers among males are so accounted for. Among females, cancer of the genital organs and cancer of the breast are very prominent. The former was responsible for 43.1 per cent. of all the cancer deaths occurring among the colored; 15.9 per cent. in addition were

due to breast cancers. Cancers of the skin are much more numerous among males than among females; the rate is extremely low for colored persons, being virtually negligible among colored females.

TABLE 2.—DEATHS FROM CANCER OF SPECIFIED ORGANS PER HUNDRED DEATHS FROM CANCER OF ALL FORMS, CLASSIFIED BY COLOR AND SEX*

Cancer of Specified Organs	All Persons	White Males	White Females	Colored Males	Colored Females
Cancer, all forms	100.0	100.0	100.0	100.0	100.0
Cancer of buccal cavity	3.7	9.6	1.1	7.3	1.5
Cancer of stomach and liver	37.8	49.6	33.9	53.5	21.5
Cancer of the peritoneum, intestines and rectum	11.7	13.0	11.6	10.2	8.3
Cancer of the female genital organs	21.1	....	28.8	....	43.1
Cancer of the breast	9.3	0.3	12.9	1.0	15.9
Cancer of the skin	2.6	4.5	1.9	3.2	0.9
Cancer of other organs or of organs not specified	13.9	23.0	9.8	24.9	8.8

* Metropolitan Life Insurance Company—Industrial Department—mortality experience, 1911-1914.

In general, there is clearly a larger proportion of surgically accessible cases among females than among males. Hospital statistics show that the cancers which are responsible for a large part of the female mortality—those of the genital organs and of the breast—are most susceptible to treatment. At Johns Hopkins Hospital, 11.1 per cent. of the operations for cancers of the female genital organs proved fatal, and only 5.5 per cent. of the cancers of the breast. We may, therefore, expect a large reduction in the female cancer mortality from organized efforts to bring cases to early treatment.

The third table presents the average ages at death of the persons who have died of cancer of the various forms. It is evident that the average age of females at death from cancer of all forms is about two and one-half years lower than that of males: 54.8 years as against 57.2 years. Among males the average age at death from the different causes varies between 53.7 (for cancer of other organs) and 61.8 (for cancer of the breast and cancer of the skin). Among females the variation is within wider limits, the minimum age

TABLE 3.—AVERAGE AGE AT DEATH FROM CANCER OF SPECIFIED ORGANS, CLASSIFIED BY SEX*

Cancer of Specified Organs	Average Ages of		
	All Persons	Males	Females
Cancer, all forms	55.5	57.2	54.8
Cancer of the buccal cavity	58.9	59.4	57.3
Cancer of the stomach and liver	58.3	58.3	58.4
Cancer of the peritoneum, intestines and rectum	56.1	55.8	56.3
Cancer of the female genital organs	51.1	....	51.1
Cancer of the breast	53.9	61.8	53.8
Cancer of the skin	62.7	61.8	63.7
Cancer of other organs or of organs not specified	52.9	53.7	52.1

* Metropolitan Life Insurance Company—Industrial Department—mortality experience, 1911-1914.

at death being 51.1 (for cancer of the female genital organs) and the maximum being 63.7 (for cancer of the skin). The age at death for cancer of the buccal cavity, cancer of the breast and cancer of other organs is higher among males than among females. There are slight differences in favor of the females, on the other hand, in connection with cancer of the stomach and liver, cancer of the peritoneum, intestines, and rectum, and cancer of the skin.

A consideration of the average ages at death is important, because they indicate the loss to the community that is occasioned by cancer deaths. At 55 the expectation of life at the present time in New York City is over fourteen years; at 60 it is almost twelve years. If, for the sake of argument, we assume an average loss to the community of fifteen years of life for each cancer death, it will at once be seen how huge is the loss to the community as a whole. At the present time a conservative estimate places the total number of cancer deaths in the United States at 80,000 a year. This means a loss to the community of an aggregate of 1,200,000 years of life. It is futile to consider the monetary value of this loss; as I have already pointed out, the interest of the community in this disease is not primarily economic. Our great desire is to allay the suffering of the many thousands of persons who annually succumb, and, if possible, to extend to persons of middle life and early old age a few additional years of peaceful enjoyment. This will be a gain to civilization of no mean value. We shall have accomplished much if we assure those who are just entering the portals of old age that the declining years of their life will not be beset by the gaunt specter of cancer. That the happiness of thousands of families will be preserved, and that thousands of individuals will be spared unbearable pain, surely means more to the community than can be estimated in terms of dollars and cents.

To accomplish this end, two lines of effort are clearly indicated. The first is immediate and undeniable. It is to reduce, by the best means at our disposal, the suffering and premature death of cancer patients. At the present time the greatest promise of success is held out by the surgeon. The average duration of the disease, from the first symptom to death, varies considerably with the form and location of the cancer; but, taken together for all forms of cancer, the period is about two years. The records of surgical interference, especially those of the Mayo Clinic, indicate a marked extension of life of the patients after operation. While no absolute figure may be quoted, there is an indication that an expansion of life of about three to five years is accomplished for about half of the cases. The extent of the additional years depends on the timeliness of the operation, the failures being the advanced cases. If, therefore, it can be arranged that early diagnosis be followed by immediate operation, the average duration of life of cancer patients can be appreciably prolonged. If an average of five years could be added to these lives, this would be equivalent to a reduction of more than one third of the total loss. This is clearly the community's immediate program.

The second line of effort lies in investigating into the basic facts of cancer—the etiology of the disease, its method of dissemination, the problem of inheritance, and, finally, the measures of relief. This is the field of the pathologist and the surgeon, rather than of the statistician, the sociologist, or the lay investigator. I wish to devote brief attention, however, to a contribution to this effort which is being made by the life insurance companies, and which promises to cast valuable light on the entire problem.

At the request of the American Society for the Control of Cancer, a committee[1] representing the

1. Mr. Arthur Hunter, New York Life, chairman; Dr. F. C. Wells, Equitable Life; Dr. W. A. Jaquith, Prudential; Dr. Brandreth Symonds, Mutual Life, and Louis I. Dublin, Metropolitan Life.

largest life insurance companies has made all the necessary preparations to carry on a special study of the life insurance returns for two forms of cancer which are readily diagnosed, namely, cancer of the buccal cavity and cancer of the breast. Special forms have been drawn up for this purpose, covering the following points:

INQUIRY BLANK FOR THE STUDY OF CANCER OF THE BREAST (OR OF THE BUCCAL CAVITY)

Name of patient; address; department; claim number.

Personal and social facts about deceased: color; sex; nearest age at death; place of birth; birthplace of deceased's mother (if readily ascertainable). Was deceased single, married, widowed or divorced?

Occupation: general nature of industry or business; trade or particular kind of work.

Family history of deceased: Have other members of deceased's immediate family died from cancer of the breast (or buccal cancer)? Have other members of deceased's immediate family died from other forms of cancer? Have other members of deceased's immediate family had and survived any form of cancer? If so, state relationship; also give type of cancer.

History of breast lesions: Any history of blow, wound, irritation or other injury to breast? Please specify. Type of mammary gland (large, small, adipose?). Lactation: first and last date of lactation if possible. Any difficulty with lactation? Any history of mastitis? Habits: Was deceased a vegetarian? A heavy meat eater?

History of buccal lesions: Any history of irritation from teeth? Any history of other irritation or injury to buccal cavity? Any history of syphilis? Leukoplakia? Habits: Did deceased use alcoholic beverages? Abstainer? Moderate user? Excessive user? Did deceased use tobacco? Pipe? Cigar? Cigaret? Chew? Was deceased a vegetarian? A heavy meat eater?

Cancer history: Date when first symptoms were observed. Type of tumor when first observed. Location of initial tumor. Metastasis to —. Type of tumor at time of death. Location of tumor at time of death.

Cancer treatment: Give approximate dates, kind of treatment and results: (*a*) medical treatment; (*b*) surgical treatment; (*c*) other treatment (Roentgen-ray, radium or other).

Other diseases or conditions intercurrent with cancer.

Pathologic report: Gross appearance of tumor (if of the breast, was the skin or muscle, or both involved?). Microscopic report (if of the breast, give details of structure of growth).

Necropsy report: Please give findings.

Any other information of value.

Date, and signature of physician.

The plan is to send one of these blanks to each of the physicians who sign the death certificates on the claim papers returned to the life insurance companies, and to ask for more information with reference to the case. By these means the companies hope to obtain all the important facts with reference to the history of the deceased and of his or her family. The history of the lesion is gone into fully, to determine whether there has been any blow, wound or irritation; the cancer history is listed, as well as the nature of the treatment. Record of necropsy or of pathologist's report is called for. We hope to receive this information in a large proportion of cases, and at the end of a requisite period the entire material will be analyzed as a unit and a report will be issued. Thus we trust that we shall be able to add materially to the amount of exact knowledge with reference to cancer.

The insurance companies, as well as the American Society for the Control of Cancer, hope and trust that these forms will receive the careful attention of specialists and general practitioners, and the enthusiastic cooperation of the medical profession is confidently counted on as one of the essential instruments in this investigation.

The Child a Barometer of Its Health.—Just as hot house plants are exceedingly sensitive to their surroundings and only thrive when placed in the most favorable surroundings as regards light, warmth and soil, and quickly show by drooping, the slightest departure from favorable conditions, so do infants respond favorably or unfavorably to feeding, housing and general environment, according as these are good or bad.—Ashby.

HEMOGLOBINURIC FEVER

TREATED BY INFUSIONS CONTAINING QUININ

WILLIAM O. OTT, M.D.
NEW ORLEANS

A white man, aged 35, telegraph operator, was admitted to the medical service of Dr. J. M. Elliott in the Charity Hospital, Dec. 13, 1915, with hemoglobinuric fever. The patient had lived in a malarial district for the past six months; since September, 1915, at Angola, La., and before that time, near Jackson, Miss. Both places are in malarial districts. The patient had several attacks of malaria the preceding August while living near Jackson, and had had chills with fever every ten or fifteen days since moving to Angola. For the past two months the patient had been somewhat jaundiced and very much run down. He had taken quinin irregularly since summer, and large amounts of it at times.

The present illness began Sunday, Dec. 12, 1915. The patient was feeling bad when he returned from work Sunday morning (night operator), and he took several capsules of quinin at about 8 a. m. He was up most of that day, but felt feverish in the afternoon. At about 4 p. m. he had a severe chill with high fever. He began to vomit and pass bloody urine shortly after the chill. He was very restless that night, with frequent vomiting and a distressing hiccup. The fever remained high all that night, and he had another severe chill in the early part of the night. Monday morning it was noticed that he had become deeply jaundiced. The temperature was 104 at this time, and he continued to pass almost black urine in small amounts. The vomiting, hiccup and high temperature, with the extreme restlessness, continued all that day. At 7:30 p. m. he was admitted to the Charity Hospital with a temperature of 103. He was evidently a very sick man. He was restless and vomited a yellowish fluid at short intervals. The urine was dark red, almost coffee colored, and was passed in small amounts. He complained of tenderness and pain in the epigastric region from the prolonged vomiting. The patient was well developed and well nourished and deeply jaundiced, with the sclera lemon yellow. The mucous membranes were pale. The spleen was soft, tender to pressure, and reached 3 inches below the costal margin. The liver was not palpable. There was tenderness over the entire upper abdomen. Otherwise, the physical examination was negative.

At 9:30 and 11:30 p. m., 10 grains of quinin sulphate were given by mouth. This was not retained and it was discontinued. An opiate was given at 12:30 a. m. for the extreme restlessness. The patient vomited several times during the remainder of the night, but slept at intervals. In the forenoon of December 14, the condition became much worse. Vomiting was almost continuous and the restlessness extreme. There was no absorption from proctoclysis. A small amount of almost black urine was passed during the forenoon. The prostration of the patient increased, and death seemed imminent. It was decided to give quinin, and at 11:30 10 grains of quinin dihydrochlorid in 300 c.c. of saline solution were given intravenously. The condition of the patient seemed better shortly after the infusion. In the afternoon the restlessness and vomiting decreased, and the patient was much more comfortable, and was voiding more freely. The saline infusion containing 10 grains of quinin dihydrochlorid was repeated at 4:30 and 10:30 p. m. By 6 p. m. the temperature had dropped to 99, and the appearance of the patient was greatly improved. The night of December 14 was passed fairly comfortably, although no liquids were retained and an opiate was required for restlessness. December 15, the quinin infusion was given at 11 a. m. and 4 p. m. The patient was much improved, and there was absorption from proctoclysis on this date. Liquids were not retained by mouth. The jaundice was not so intense. There was free secretion of urine, and it was of a light wine color. At 2 p. m., December 16, one quinin infusion was given. The patient retained liquids. Urine secretion was free and lighter in color. December 17, the urine was entirely clear,

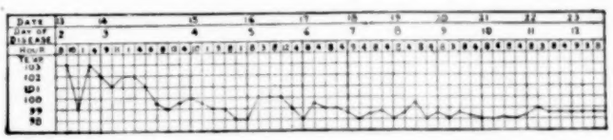
the jaundice had almost disappeared, and the spleen reached 1½ inches below the costal margin, and was firm. Quinin sulphate, 10 grains, three times a day, was taken by mouth on this date and retained. This was repeated daily until the patient was discharged.

The urine and blood findings are those characteristic of hemoglobinuric fever. The first urine on admittance was dark red, almost black, and contained albumin, hyaline and granular casts, no red blood cells, but hemoglobin, and a large amount of a dirty, brownish granular detritus. By December 18 the urine was clear of albumin, casts and hemoglobin. No plasmodia were found in the blood on admittance, or subsequently. December 21, the blood examination showed: total whites, 6,050; total reds, 2,800,000; lymphocytes, 47 per cent.; large mononuclears, 1 per cent.; transitionals, 4 per cent.; neutrophilic leukocytes, 46 per cent.; myelocytes, 2 per cent., and hemoglobin, 55 per cent.

In answer to a letter two months after discharge, the patient stated that his improvement was uninterrupted after his return home, and that he felt better now than at any time in the last five years. He had been free from attacks of malaria, and had gained weight rapidly.

COMMENT

The question as to whether the marked improvement after the infusion was due simply to supplying fluids to the body, or to the quinin contained in it, presents itself. Recently, Bruce-Porter[1] observed marked improvement with repeated saline infusions containing no quinin. Burkett[2] used Roger's hypertonic solution, and he believes that the improvement noted in a case so treated was due to overcoming acidosis. In our case, the rapid fall in temperature with only a slight subsequent rise, and the rapid amelioration of the vomiting, singultus and abdominal distress after the infusion, makes one feel that the improvement which followed was dependent, to some extent at least, on the quinin. Certainly no ill effects resulted from its administration. On the contrary, there was a rapid drop in temperature after the intravenous quinin, and a great improvement in the patient's condition. The improvement continued uninterruptedly until he was discharged from the hospital.



Temperature chart.

The treatment of hemoglobinuric fever with large doses of quinin is not the generally accepted one at present. The physicians of the Isthmian Canal Commission, notably Brem,[3] and Deeks and James,[4] advise against its use during an attack of hemoglobinuria. The latter authors, however, recommend its cautious use if parasites are present. Stephens[5] advises withholding quinin during the attacks of hemoglobinuria, unless parasites are present in such numbers that the symptoms can in part be attributed to them.

The exact cause of hemoglobinuric fever is unknown, and for this reason the rationality of any treatment of this condition must still remain in doubt in spite of the large advance that has recently been made in the study of this disease. The association of blackwater fever with malaria has long been known, and strong evidence is at hand pointing to its malarial origin. Stephens,[6] in collecting reports of a series of cases, gives the percentage of positive blood examinations the day before onset, the day of the onset and the day after the onset of blackwater, as 73, 47.5 and 23, respectively. This confirms the observation first made by Panse,[7] that the parasites disappear from the peripheral circulation with the outset of hemoglobinuria. Ross, Thompson and Simpson,[8] in explaining Panse's law, suggest that in blackwater fever the old worn out red cells are hemolyzed, and new ones containing no plasmodia rapidly take their place. The asexual plasmodia, being unable to live free in the plasma, are destroyed. In this way, a large percentage of the asexual parasites are destroyed. This explains why many patients are relieved of their malaria for months by an attack of hemoglobinuric fever. It is believed by some that hemoglobinuric fever is a self-limited disease, and that the hemolysis, with its consequent hemoglobinuria, is an expression of nature to rid the body of the infection. The severe symptoms present are thought to be the result, in part at least, of setting free this large amount of hemoglobin in the plasma. This belief is supported by observations of Barratt and Yorke[9] and of Yorke and Nauss,[10] who produced severe symptoms, anuria, and even death in animals, by injecting a hemoglobin solution.

Without entering into a discussion of the cause of the very remarkable hemolysis that takes place in this condition, for the whole subject is still in obscurity, certain facts that bear on the treatment stand out. In the first place the sequence of the administration of quinin, and the onset of hemoglobinuria several hours afterward, is a well established fact. On the other hand, there are many cases on record in which quinin as a causative factor in initiating the onset can be eliminated. Quinin is also thought to increase the hemolysis, and consequently the severity of the symptoms in some cases, when given during an attack. Barratt and Yorke,[9] who conducted experiments to determine the hemolytic action of quinin, conclude that quinin has no more hemolytic action on the red cells of hemoglobinuric fever patients than on those of normal persons. They also conclude that it does not act directly in the circulation, for to do this would require a fatal dose. Ross, Thompson and Simpson[8] observed a case in which the fall in hemoglobin began forty-eight hours before the onset of hemoglobinuria and twenty-four hours before the paroxysms of chill and fever. The presence of malarial plasmodia is a fairly constant finding at the beginning of the attack, the blood being positive in 73 per cent. of the cases the day before the onset of the blackwater. If the fall in hemoglobin content of the blood occurs forty-eight hours before the onset of symptoms, as it did in the case cited above, plasmodia are present in something

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2. Burkett, R. W. P.: Blackwater Fever, Lancet, London, Nov. 20, 1915, p. 1138.
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4. Deeks, W. E., and James, W. M.: A Report on Hemoglobinuric Fever in the Canal Zone; A Study of Its Etiology and Treatment, 1911, Mount Hope, C. Z., p. 177.
5. Stephens, J. W. W.: Modern Medicine, Osler and McCrae, ii, 115.
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10. Yorke, M., and Nauss, R. W.: The Mechanism of the Production of Suppression of Urine in Blackwater Fever, Ann. Trop. Med. and Parasitol., 1911, v, 287.

over 73 per cent. of the cases at the onset of the hemolysis. This is certainly presumptive evidence, at least, of the malarial plasmodia as a causative factor, and would seem to justify the use of quinin. The question of the possibility of doing harm to the patient with this drug must, of course, be borne in mind.

Quinin is best given in an infusion, since it is not retained by mouth. Besides this, the infusion is not an unimportant part of the treatment, for the demand for fluids is urgent. Yorke and Nauss[10] observed that anuria and death were less likely to supervene in rabbits injected with a hemoglobin solution if the rabbit had been previously supplied with fluids, than if it had been deprived of fluids. Hemoglobinuric fever patients usually vomit all fluids, and proctoclysis will often not be absorbed. From 300 to 500 c.c. of saline solution in which not more than from 5 to 10 grains of quinin dihydrochlorid have been dissolved may be given and repeated every six to eight hours so that the patient gets from 15 to 30 grains of quinin in twenty-four hours.

Don'ts to Be Observed in the Management of Hypertensive Cardiovascular Disease.—1. Don't tell the patient with moderate hypertension, few symptoms and whose kidneys are functioning well to stop eating meat, or go on a milk diet.

2. Don't tell him to immediately give up his business; try to readjust his life so that unnecessary cardiovascular strain is reduced to a minimum.

3. Don't tell him his kidneys are "all right," just because his urine exhibits neither albumin nor casts.

4. Don't miss the significance of nocturnal polyuria and a persistently low gravity.

5. Don't give nitroglycerin tablets to your patient the moment you discover that he has hypertension. Perhaps he requires a high pressure to get the blood through his small inelastic vessels.

6. Don't be satisfied with the systolic pressure—the diastolic is often of more significance.

7. Don't attribute the insomnia, nervousness and headaches in the middle aged woman to "the change"—take her blood pressure and examine her eye grounds.

8. Don't make a diagnosis of neurasthenia till after a blood pressure estimation and a Wassermann test. It may save subsequent embarrassment and even be of advantage to the patient.

9. Don't think you are doing your whole duty to your pregnant patient when you have examined her urine. She may have hypertension but no albumin today and eclampsia next week.

10. Don't consider hypertension solely a condition of middle life; it is occasionally present in childhood.

11. Don't forget the old man's enlarged prostate. It may be the cause of the nephritic syndrome.

12. Don't hesitate to give digitalis when symptoms of cardiac failure are evident. It will not raise the blood pressure.

13. Don't wait until the patient is water logged and the heart dilated before suspecting a failing myocardium.

14. Don't deny your sleepless gasping patient, whose course is nearly run, the relief that only morphin will give.

15. Don't make a prognosis solely on the blood pressure or phenolsulphonephthalein test. Each tells but part of the story.

16. Don't overlook the fact that cardiovascular disease is to a certain degree a familial condition sometimes present in several generations; nor neglect to explain the importance of a yearly blood pressure estimation of all members of the family.

17. Don't exclude syphilis, especially a parental infection, as the cause of the hypertension solely because the Wassermann is negative. Study the family history; examine the brothers and sisters, and your patient's children for signs of hereditary syphilis.

18. Don't fancy that the management of hypertension consists in watching a column of mercury or that success is measured in millimeters.—HENRY FARNUM STOLL, M.D., Hartford, Conn.

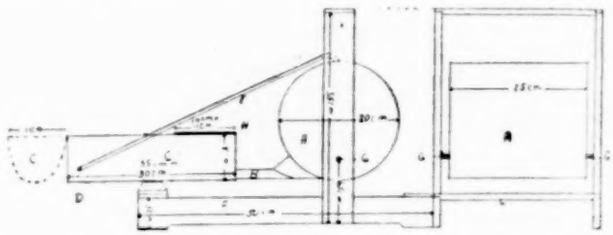
New Instruments and Suggestions

A PORTABLE SHELLACKING DEVICE FOR KYMOGRAPH RECORDS*

R. G. HOSKINS, PH.D., CHICAGO

A shellacking device should have the following characteristics: It should be compact, should contain a fairly large quantity of the fluid adequately protected from evaporation, and should be as nearly as possible automatic in action. The use of rubber tubing should be avoided. With these requirements in mind, the apparatus herein described has been devised. Several months' use has proved its practicability.

It consists essentially of a cylindric reservoir, *A*, with an outflow, *B*, leading to an open trough, *C*, in which the records are dipped. The height of the fluid in the trough is determined by the position of the mouth, *D*, of the vent tube, *E*. The reservoir is mounted eccentrically in a wooden supporting frame, *F F*, by the pinions, *G G*. The purpose of this mounting is to make the apparatus stable either in the horizontal position, as shown, or with the trough elevated. When so elevated by rotation on the pinions, the fluid flows into the reservoir. The proximal part of the trough is covered by the lid, *H*, soldered on to form a receptacle for the fluid, when the apparatus is first moved into the elevated position. From this receptacle it drains quickly back into the reservoir while an equal quantity of air is displaced through the vent, *E*. (For wide records the larger dimensions of *C* should be used.) The reservoir trough and outlet tube, *A*, *B* and *C*, are made of galvanized iron. The vent tube is of brass, 1 cm.



Lateral projection of portable shellacking device for kymograph records.

outside diameter. When the apparatus is not to be used for some time, the opening of the outlet tube is closed by a cork stopper mounted on a wire handle.

The formula for the fixing fluid used in this laboratory is:

Gum dammar	300 gm.
Benzol (benzene, C_6H_6)	2,000 c.c.

This gives a hard elastic semigloss finish. It is said that a similar result may be obtained by diluting ordinary "hard oil finish" with benzene.

A SEPTAL SPLINT†

CLIFFORD B. WALKER, M.D., BOSTON

Cotton or gauze plugs wrapped with Cargile membrane make a very satisfactory nasal packing as regards hemostasis, easy withdrawal and prevention of adhesions. It is very uncomfortable for the patient, however, in that it occludes the breathing space and distends the nose painfully. Further, it is almost impossible to pack the septum truly in the midline. A proper septal splint, therefore, would be desirable.

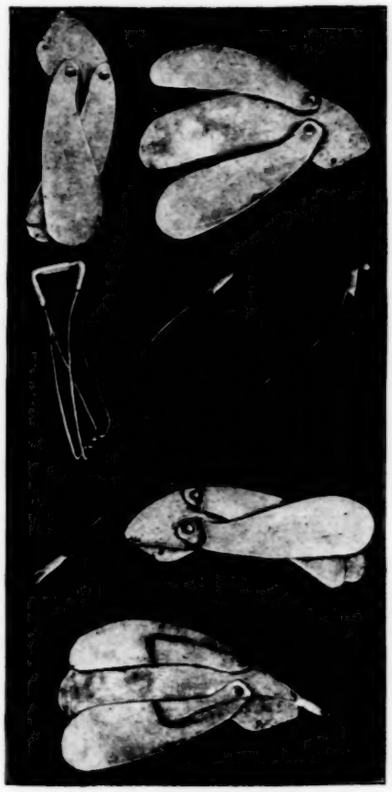
The vertical opening of the lower nares is only about one third of the vertical extent of the septum, yet septal splints have always been limited to the size of the lower nares. Experimenting with a variety of expanding splints, I have found wire unsatisfactory in that it readily embeds in the soft tissue and allows an edematous or hematomatous ballooning between wires, making removal difficult unless

* From the Laboratory of Physiology of the Northwestern University Medical School.

† From the Peter Bent Brigham Hospital.

they are straight like the ribs of a fan, without loops or meshes. The same thing occurs with blades having large perforations. Devices having the two members on a fixed spring are difficult to place and move and difficult to withdraw, because of the enlarged external portion of the septum. Finally, a splint satisfying our demands was made as described below.

After a study of the size and shape of the area to be splinted in the average nose of a sagittally sectioned cadaver head, a splint blade having three wings and shaped as at *B* in the accompanying illustration was cut from 0.5 mm. aluminum sheeting and pivoted together with single flat rivets. When these wings are collapsed (as at *A*), they readily enter the lower nares, the wings shifting somewhat in accommodation to the constricting point in transit. After passing into the nose, the anterior member may be held either with a forceps or with a thread passed through a small perforation (as in the illustration), while the wings are moved by use of a probe or forceps into position to cover the entire septum. The wings of the splint being very light, adhere sufficiently to the moist membranes while the adjustment of the retaining springs is accomplished.



Septal splint: *A*, aluminum wings collapsed; *B*, wings widely opened to show shape; *C*, retaining springs locked; *D*, one member of springs open; *E*, spring closed to pass through lower nares; *F*, position for combination insertion; *G*, approximate final position in nose.

The retaining springs (*C*, *D*, and *E*), act in two ways: first to spread the wings gently to the extent of the septum, and second to press them lightly against the septum when the lower or external portions are united. This union is made up of a male and female sliding lock acting at right angles to the spring. By this device the springs may be made to press together with any desired pressure and the pressure thus developed automatically locks the parts in position.

The distal ends of the springs are bent so that their pressure will be distributed from about the center of the upper and the lower wings, and they are provided with claws to engage the margin of the wings, which are slightly everted to receive them. At the same time the claws may slide along these margins (*G*) so that the external portion may fit snugly and neatly into the angle between the upper lip and the external portion of the septum. These claws are also used to assist in placing the springs in position, since they are so designed that they can be caught in each other, as shown at *E*. Then the spring is reduced to a size which will readily pass through the lower nares. When in the proper position between the upper and lower blades, a slight push on the upper distal portion of the spring will release the claws, and they will immediately engage on the ridges of the wings, if at the same time the claws are pressed against the middle plate. If by chance either claw fails to engage, it is easily pushed into position with the forceps.

It is not necessary, however, to put the spring on as a second step. Indeed, it has usually been found easier first to attach the spring near the rivets, as shown at *F*, and then, after the blades have been passed into the nose, the spring is pushed in a sufficient distance and locked with its fellow.

If turbinates have been cut at the operation sufficiently to demand packing, Cargile membrane may be easily placed properly in the nose, since the splint occupies a negligible amount of space. Thus the septum may be kept symmetrically centered, whether or not packing is used. The splint is very easily removed, disclosing a beautifully smooth unruffled septum. The splint may be removed in from twelve to thirty-six hours, but it can be left in for three days, or after removal it may be reapplied the next day if from trauma or other cause the septum should bleed or become distorted. The instrument, finished much better than the original model here shown, may be obtained from E. B. Meyrowitz, New York.

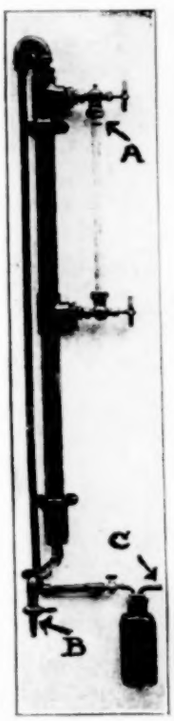
697 Huntington Avenue.

AN ASPIRATING APPARATUS FOR OFFICE AND HOSPITAL USE IN OBTAINING GASTRIC CONTENTS

PHILIP ATLEE SHEAFF, M.D., PHILADELPHIA

The device shown in the illustration may be assembled at small cost by any plumber; it is an improvement over the usual method of obtaining gastric contents by the use of the bulb or Politzer bag. The large vertical portion is composed of 1¼ inch pipe and fittings and measures 38 inches over all, with a half-inch water gage attached to its upper half. Both extremities terminate in quarter-inch pipe, one end being connected by rubber tubing to an aspirating bottle, and the other end equipped with a cock and discharging into the wash stand basin, being a permanent fixture in proximity to it.

Before use, the standpipe is filled with water to the level of *A* by connecting *B* and the wash stand faucet with a piece of rubber tubing. When in use the stomach tube is slipped over the glass tubing at *C*, its free end passed into the patient's stomach, cock *B* is opened, the column of water descends, and the gastric contents flow into the bottle.



Apparatus for aspirating gastric contents.

4005 Baring Street.

A SUGGESTION FOR THE DIAGNOSIS OF HAY-FEVER

A. PARKER HITCHENS, M.D.,
GLENOLDEN, PA.

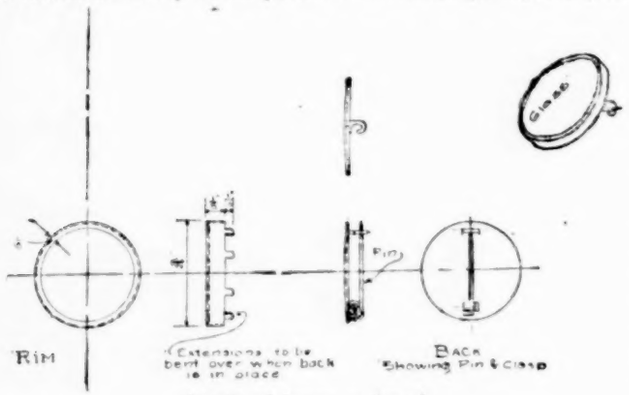
Diagnosis in hay-fever is in some ways more difficult than diagnosis in the case of bacterial infections. Indeed, if we include all the conditions concerned in periodic attacks of sneezing and periodic conjunctivitis, identification of the causative agent may be much more difficult; for plant pollens are not by any means the only source of protein substances in the atmosphere to which certain individuals may be hypersusceptible.

We are not yet acquainted with the complete catalogue of pollens concerned in hay-fever. Of the very common causes, the list is probably small; in fact, we shall relieve a very great majority of our patients if we can render them insusceptible to a few of the grass pollens in the spring; and in the fall, if we eliminate ragweed, the number of persons with a severe type of the disease will be small.

In undertaking a rational therapy, specificity is at present believed to be a matter of great importance. Goodale[1] has been especially interested in determining whether or not a person susceptible to the pollen of one member of a genus or even of a natural order, might be susceptible to all the other members of the group, and furthermore, how far specificity is requisite with regard to treatment.

Whatever may be the limits of specificity, the fact that an individual suffering from the spring type of hay-fever may not be affected at all in the fall, and vice versa, suggests that the successful vaccine should contain an extract of pollen homologous at least with regard to the natural order, if not indeed to genus and species. It is important, therefore, to ascertain which pollens are inhaled by the patient during his hay-fever season.

Ophthalmic reactions have been suggested as one means of making such a diagnosis. This method, however, is not unattended by danger. Cutaneous reactions are equally trustworthy, and have the advantage of being entirely harmless. According to this system, a patient not entirely relieved by a vaccine containing the ordinary pollens of the season may be safely tested successively with a long list of extracts, those to which he reacts being noted and included in his vaccine. As suggested in the paper by Dr. Brown and myself,[2] a botanical survey of the patient's surroundings, especially of



Details of button or brooch.

the neighborhood where his most violent symptoms occur, may reduce the pollens probably responsible to a very small number.

In collecting the pollen, the glycerin coated slides used by Phoebus,[3] Blackley,[4] Dunbar[5] and others have suggested a little device which may be of practical assistance in ascertaining the varieties of pollen with which the patient comes in contact. This device is in the form of a button or brooch consisting of a circular metal frame with prongs attached at the back edge. An ordinary round coverslip is placed in the frame, then a pad of some kind to prevent fracture, and finally the solid metal back with the pin attached, which is held in place by the prongs mentioned above. After the coverslip is coated with the glycerin mixture suggested by Blackley,[6] the brooch may be worn on the coat or waist for a certain number of hours and then sent to the laboratory, where the coverglass is removed, mounted and examined under the microscope.

If the patient notes that in a certain locality his symptoms become especially severe, the brooch may be removed and left in a properly protected place for a sufficient period to collect the pollens in that particular neighborhood.

1. Goodale: Pollen Therapy in Hay-Fever, Boston Med. and Surg. Jour., 1915, clxxiii, 42.
2. Hitchens and Brown: Hay-Fever and Certain Other Local Anaphylactic Phenomena Referable to the Respiratory Mucous Membranes, Jour. Lab. and Clin. Med., 1916, 1, No. 7, p. 457.
3. Phoebus: Der typhische Fruhsommer-Katarrh oder das sogennannte Heufieber, Heuasthma, Giessen, Ricker, 1862, p. 136.
4. Blackley: Catarrhus Aestivus, London, Bailliere, Tindell and Cox, 1873, p. 75.
5. Dunbar: The Present State of Our Knowledge of Hay-Fever, Jour. Hyg., 1913, xii, 105.
6. Blackley's Mixture consists of:

Water	1 part
Alcohol	2 parts
Glycerin	1 part
Phenol (carbolic acid)	1 per cent.

Therapeutics

HYPERTENSION

(*Continued from page 811*)

DRUGS IN HYPERTENSION

The drugs that are mostly used to lower blood pressure are nitrites or drugs which are like nitrites, and these are nitroglycerin, sodium nitrite, erythroltetranitrate and amyl nitrite, and the frequency of their use is in the order named. Other drugs used to lower blood pressure are iodids, thyroid, alkalies, chloral, bromids and aconite, the latter rarely.

Amyl nitrite is required only when a sudden immediate effect is desired in angina pectoris or in some other serious spasmodic condition. Sodium nitrite is more likely to upset the stomach than is nitroglycerin. It acts, however, a little longer, but not enough to warrant its frequent selection. The dose of sodium nitrite is from 0.03 to 0.06 gm. (½ grain to a grain), best in tablet form and given with plenty of water. The tablet should of course be dissolved or crushed with the teeth. It should not be given on an empty stomach, as it may cause considerable irritation and pain. It more or less actively lowers the blood pressure for about an hour.

Erythrol tetranitrate is preferred by some clinicians who find that its effect lasts somewhat longer. There is probably, however, no better nitrite or nitrate than nitroglycerin. While it acts but a short time, it acts effectively, and although no nitrite has vasodilating effects for any length of time from one dose, when the doses are given repeatedly and for days at a time, the blood pressure will generally be more or less reduced. The dose is from $\frac{1}{500}$ to $\frac{1}{100}$ grain, three or four times a day, or every three hours, as desired. The best form in which to use it is in a very soluble tablet, and the tablet should not be dissolved unless intense immediate action is desired. It acts when absorbed from the tongue almost as rapidly as when given hypodermically; it acts in two or three minutes, and the blood pressure may drop from 20 to 30 mm. In experimental tests the action does not last more than from fifteen minutes to half an hour, but clinically the effect of repeated doses is much more satisfactory. Spirit of glyceryl trinitrate or spirit of nitroglycerin, dose 1 minim, keeps well if care is taken to guard against evaporation of alcohol; tablets if well made and kept in bottles properly corked, will retain their activity for months.

The closer a physician is to the laboratory, the less he believes in the value of nitroglycerin in hypertension. The nearer he is to clinical work the more he believes in it. It is a fact that in some instances, even with a dose as small as $\frac{1}{200}$ grain of nitroglycerin, three or four times in twenty-four hours, the blood pressure will be lower, whatever the diet is and whatever the other treatments are, than if the patient does not take the nitroglycerin. Also the value of these short relaxation periods from the standpoint of a strained and tired heart should not be underestimated, the same as the value of a night's rest, or the value of a recreation period of an hour or two. If a patient has hypotension and a systolic pressure of 110, and is given nitroglycerin, the very unpleasant results from its administration will be immediately noticed. Hence nitroglycerin is one of the most valuable drugs that we possess for the treatment of hypertension, and some patients are even benefited by as small a dose as $\frac{1}{500}$

grain. Lawrence[63] found that the fall of diastolic pressure from nitrites was about half of the fall of systolic pressure. When there is no kidney lesion a very high systolic pressure falls more under nitroglycerin than does a medium high systolic pressure.

Alkalies, whether potassium or sodium citrate or sodium bicarbonate, are often of advantage in so changing and aiding metabolism, or perhaps reducing the irritation from hyperacidity or a mild condition of acidosis, that their administration causes a lowering of blood pressure.

While iodids may not be direct vasodilators and do not render the blood more aplastic or diminish its viscosity, as shown by Capps,[64] still, iodids in small doses, 0.1 to 0.2 gm. (1½ to 3 grains) given from once to three times a day, after meals (these small doses do not disturb the stomach), will stimulate the thyroid gland to greater activity, and when this gland secretes properly, the blood pressure is somewhat lowered. Of course, in syphilitic sclerosis large doses of iodids are indicated and are valuable.

In obese patients with hypertension, in the hypertension of women at the menopause, and in hypertension with insufficient kidneys, thyroid medication is often of great value. Sometimes a small dose of from 0.1 to 0.2 gm. (1½ to 3 grains) once a day is all that is needed. At other times, especially when there is no marked arteriosclerosis and no marked kidney or liver lesion, very high blood pressures are reduced only by very large doses, even as much as 10 grains a day. Such treatment is often of very great benefit. Of course, if one of the persons under consideration has symptoms of hyperthyroidism, or if small doses of thyroid cause palpitation, the treatment is not indicated, on the one hand, and should be stopped, on the other. Sometimes when the blood pressure cannot be reduced, in these cases without apparent organic lesions, and thyroid treatment is more or less successful, but at the same time causes great excitation, it may be combined with bromid medication, and then the benefit is sometimes very great.

A patient who cannot sleep and who has hypertension may receive bromids if he is very irritable or if there are symptoms of thyroid irritability; but the most successful sleep and lowering of blood pressure is caused by chloral. A dose of 0.5 gm. (7½ grains) at night is generally sufficient and need not be long continued. Chloral has been frequently given to reduce pressure in 0.2 to 0.25 gm. (3 or 4 grain) doses, three times a day, after meals.

Bromids, of course, will lower the blood pressure, but they depress all metabolism, interfere with digestion, and are not advisable for any length of time. However, in some cases they cause a marked improvement in the patient's condition.

Patients under treatment with chloral, bromids, and thyroid especially, should be carefully watched and the treatment modified to meet the varying conditions. Patients under iodid need not be seen so frequently; those under nitroglycerin or alkalies still less frequently. But all patients under the active management of hypertension should be seen at from one to three week intervals, and the urine should be repeatedly examined and the blood pressure carefully recorded.

63. Lawrence, C. H.: The Effect of Pressure-Lowering Drugs and Therapeutic Measures on Systolic and Diastolic Pressure in Man, Arch. Int. Med., April, 1912, p. 409.
64. Capps, J. A.: Effect of Iodids on the Circulation and Blood Vessels in Arteriosclerosis, THE JOURNAL A. M. A., Oct. 12, 1912, p. 1350.

HYPOTENSION

A low systolic pressure and a low diastolic pressure may not cause any symptoms or give any cause for anxiety. It does show, especially if the systolic pressure is below normal for the age of the person, a lack of reserve power, and such patients will not well stand serious illnesses, operations, injuries or serious physical and mental strains. If there is a low systolic pressure and a high diastolic pressure, this shows impairment of the heart, whether or not any other organic lesion is present.

Generally speaking, a low systolic pressure shows a weak acting heart muscle, and a very low diastolic pressure shows a dilated condition of the arterioles. In aortic regurgitation this low diastolic pressure is constantly in evidence, and, if the systolic pressure is not below normal, does not signify that the circulation is insufficient. If the systolic pressure is not very low but the diastolic is high, vasodilator drugs, by lowering the diastolic and increasing the pulse pressure, are often of benefit. If there is increased venous congestion and increased venous pressure and a high diastolic pressure with a low systolic pressure, digitalis not only will often raise the systolic pressure, but also will lower diastolic by improving the general circulation and removing venous congestion.

While intestinal indigestion and absorption of toxins often tend to raise the blood pressure, some toxins thus absorbed, especially of the ptomain variety, lower blood pressure and cause shock, perhaps by weakening the muscle of the heart or by acting on the vasodilator vessels; or they may cause dilation of the vessels of the abdomen and in this manner lower blood pressure.

Very low blood pressure after exertion, after severe physical exercise, or after competitive athletic tests shows that the heart cannot sustain such strains and should not be again subjected to them. In severe mental and physical strains the suprarenals may be inhibited in their activities, and a hypotension, more or less prolonged, may result.

Sewall[65] believes that hypotension is frequently due to splanchnic stasis, and that sluggish circulation in this region, especially when the person is in the erect posture, is an important factor in general physiologic disturbances or lack of general tone. When the splanchnic vessels are dilated there is also a lack of proper tone to the cerebral vessels, and this may be a cause of mental weariness and neurasthenia. While ptosis of organs in the abdomen and a flaccid condition of the musculature of the abdomen are frequent causes of this splanchnic stasis, and therefore hypotension, especially in women, it is quite possible that suprarenal insufficiency will allow this condition of the splanchnic vessels to occur frequently.

Serious illness and infections will lower the blood pressure sometimes to a dangerous point. Of course, hemorrhages lower the blood pressure. Shock and collapse cause lowering of blood pressure, frequently to a fatal point, and Cornwall[66] finds that a patient may live several hours with a systolic pressure below 60, and several days when it is below 70; that he may walk around with a systolic pressure of 90, provided the pressure pulse is sufficiently large, that is, that the diastolic pressure is low enough to cause a circulation of blood. Of course, if the difference between the systolic and the diastolic pressure is diminished to the

65. Sewall: Am. Jour. Med. Sc., April, 1916, p. 491.
66. Cornwall: New York Med. Jour., March 7, 1914, p. 470.

vanishing point, the patient cannot stand it, and dies. It should be remembered that just before death venous pressure is likely to rise, and this may raise the diastolic pressure.

With the progressive toxemia of typhoid fever the blood pressure will become lowered from the myocardial degeneration. Of course, the blood pressure will drop suddenly from a hemorrhage, but Piersol[67] finds that with perforation the peritoneal irritation may cause a rise of blood pressure, and he thinks that this sign may precede for several hours more positive signs of the accident.

As in other infections, the blood pressure will fall in scarlet fever; but if it suddenly rises, a kidney complication is to be looked for. The blood pressure always falls in diphtheria, and always falls in acute rheumatism; consequently, strenuous sweating measures in the treatment of rheumatism should not be used as soon as the blood pressure has become low.

Failing circulation in pneumonia, if accompanied by low blood pressure, requires different treatment from the failure of circulation in these cases when the blood pressure is high. Hence the relationship of the systolic to the diastolic pressure in pneumonia is of very great importance in deciding on the proper treatment. In one instance the blood pressure must be lowered; in the other, the heart must be stimulated.

While tobacco, in ordinary conditions, raises the blood pressure, after the heart has been seriously injured by the nicotin, the blood pressure is likely to be found lower, and such patients are quickly benefited by the withdrawal of the tobacco and the administration of digitalis.

Anemia almost invariably causes low blood pressure. Also in a patient who has hypotension without any distinct evidence of disease, especially if there has been any possible exposure to tuberculosis, that disease should be suspected and every test made to eliminate such a cause.

Serious cachexia, such as that caused by carcinoma or other growths, gives low blood pressure. Diabetes causes low blood pressure, provided there are no nephritis and no marked suprarenal stimulation.

Excessive use of alcohol, while tending to promote hypertension by the disturbances that it causes, may give, by causing a weak heart muscle, a permanent low blood pressure. A single large dose of alcohol always lowers the blood pressure.

Arteriosclerosis frequently reaches a stage when the blood pressure is low, and with atheroma of the arteries of the arms a true blood pressure is difficult to obtain. Addison's disease, or any other organic lesion of the suprarenals, will lower the pressure, while stimulation of the suprarenals increases the pressure. Any great drain on the system, whether from diabetes without nephritis, or from profuse diarrhea of any type, will cause hypotension. Occasionally a girl with chlorosis who is not menstruating may have an increased blood pressure. Many of the hemorrhagic or purpuric conditions will show a hypotension.

Meningitis in various forms may show a hypertension from cerebral and nervous irritation. Neurasthenic patients quite generally have hypotension, although occasionally with suprarenal disturbance they may have an increased tension.

In the hypotension of surgical shock and in shock during anesthesia, Henderson's findings[68] that hyperoxygenation and insufficient carbon dioxid may be partially responsible for the condition should be remembered, and it has long been known that carbon dioxid congestion, as caused by laughing gas anesthesia, for instance, increases the blood pressure.

A systolic pressure of 110 mm. or lower in an adult should be considered hypotension, anything below 105 mm. calls for treatment, and a systolic pressure of 100 or lower in an adult calls for rest from all active duties.

These patients are weary, they have mental and physical tire, may get short breathed, may have palpitation of the heart, and often have headaches and dizziness from imperfect circulation in the head. There may be edemas of the legs and ankles toward night. If such patients have the systolic blood pressure raised even a small amount, or if the diastolic pressure, which is very low, is raised even a small amount, they immediately feel better.

If the kidneys are normal, they should have meat as part of their diet. If they are not nervous and irritable, coffee and tea should be allowed, except at the evening meal. While sleep may tend to lower pressure somewhat, these patients' hearts require a long bed rest; in other words, they should go to bed at an early hour. They should rise early, however, in the morning, and, as recommended by Goodman,[69] they should perform mild calisthenic exercises before dressing.

The increased muscle tone thus caused raises the blood pressure somewhat, and the great depression before breakfast is not experienced. These patients rely on their morning coffee for bracing. If they have much indigestion at night which keeps them awake so that they do not get good comfortable rest, their largest meals should be the morning and noon meals, and the evening meal should be very light.

Pendent abdomens or ptosed abdominal organs should be held up by proper abdominal bandages or corsets.

If the bowels are constipated, only the vegetable laxatives should be used, if a drug is needed at all. Salines should not be allowed, or other cathartics which cause profuse watery discharges. If a brisk purge is required, castor oil is the best.

Plenty of fresh air, and mild exercises in the open air all tend to increase the pressure. Graded walking, climbing, or other more interesting exercises are advisable, as all tending to raise the pressure, provided that at no time are they carried to the point of exhaustion.

Forced feeding may be useful. Cool sponging in the morning, if there is proper reaction, is often of benefit. Iron may be indicated; bitter tonics may be indicated. Digitalis and strychnin are often of advantage. Caffein may be used as a drug as well as given in coffee and tea. Atropin may be of value in some forms of hypotension.

At times with a low systolic pressure, but a relatively high diastolic pressure, nitroglycerin is valuable.

More or less acute hypotension may occur in hot weather or with overheating, often termed heat exhaustion. Such patients should, if possible, go to a cooler region, whether to the seashore or to the mountains is unimportant. The treatment of dangerous sudden low blood pressure, as shock, will be discussed elsewhere.

67. Piersol: Pennsylvania Med. Jour., May, 1914, p. 625.
68. Henderson: Am. Jour. Physiol., 1910, xxvii, 158.
69. Goodman: Am. Jour. Med. Sc., April, 1914, p. 503.

New and Nonofficial Remedies

ARSENOBENZOL (DERMATOLOGICAL RESEARCH LABORATORIES, PHILADELPHIA POLYCLINIC) AND DIARSENOL (SYNTHETIC DRUG COMPANY)

Report of the Council on Pharmacy and Chemistry

Arsenobenzol is made by the Dermatological Research Laboratories, Philadelphia Polyclinic, Philadelphia; Diarsenol is made by the Synthetic Drug Company, Toronto, Canada. Each of these preparations, like salvarsan, consists of the hydrochlorid of 3-diamino-4-dihydroxyl-1-arseno-benzene, with small admixtures of unimportant impurities. The Council found these products to be substantially identical with salvarsan in composition and equal to salvarsan in therapeutic efficiency. Both would have been regarded as entirely eligible for New and Nonofficial Remedies had it not been for a doubt on the subject of their legal status.

The Dermatological Research Laboratories and the Synthetic Drug Company were therefore asked whether in their opinion the sale in the United States of Arsenobenzol (Dermatological Research Laboratories) and Diarsenol (Synthetic Drug Company) was illegal, and if physicians using them are liable to legal proceedings by the owners of the salvarsan patent.

Dr. Schamberg, on behalf of the Dermatological Research Laboratories, replied:

". . . in all probability our product Arsenobenzol would be regarded by a court as an infringement on the salvarsan patents. We have had a sort of gentlemen's agreement with the American representatives of the Farbwerke-Hoechst Company whereby our laboratories would not be interfered with in distributing Arsenobenzol to the medical profession during the period that salvarsan could not be obtained in the American market. On the other hand, we tacitly agreed to cease marketing our product when a sufficient supply of the German preparation became available to the profession of this country. If in the future the supply of salvarsan should again become exhausted or so seriously impaired as to cause hardships in this country, we would again furnish the drug to physicians and hospitals. Under such circumstances no court would construe that a physician using our drug was rendering himself liable to legal procedure

The Synthetic Drug Company replied:

". . . we claim that Diarsenol is chemically identical with Salvarsan.

"Without, however, going into the question of whether it is manufactured by us exactly under the specifications of the patent in question, we might point out that in any event our product Diarsenol is legally manufactured in this country (Canada) under a license and subject to a royalty which is paid to the commissioner of patents.

"Whether this royalty is ultimately paid to the holders of the Canadian patent, Meister Lucius & Brüning, or not may depend upon the treatment accorded to British patentees by the German government after the war.

"The same firm are the holders of the U. S. patent, and we might point out that the salvarsan sold in the United States is not manufactured there but is imported from the patentees' own factory in Germany.

"At the present time Meister Lucius & Brüning are not in a position to furnish for the United States the product made by them in Germany, and as they are not attempting to manufacture in the United States they cannot be suffering any damage by the sale of our product, but on the other hand may in reality be profiting by it, if ultimately they receive the royalties paid by us to our government.

"On this account we do not think they could successfully maintain an action in the United States as they could not show that they are suffering any damage from loss of sales, and certainly not from the cutting of prices.

"Whether or not they would institute legal proceedings it is impossible to say, but so far they have not done so and our product has been on the U. S. market for nearly a year.

"If an action were brought there might possibly arise questions as to the validity of the U. S. patents, but there is no necessity of raising this question at the present time."

Owing to the possibility of patent complications, and the apparently temporary status of at least one of these products, the Council deemed it advisable not to admit Arsenobenzol (Dermatological Research Laboratories) or Diarsenol (Synthetic Drug Company) to New and Nonofficial Remedies. At the same time, it desires to point out that these products are apparently identical with salvarsan.

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

BENZIDINE. — Para-diamino-diphenyl. — 4:4' diamino-dibenzene.—$NH_2.C_6H_4.C_6H_4.NH_2$.

Actions, Uses and Dosage.—Benzidine is used in medical practice for the detection of occult blood. In the presence of hydrogen peroxid and acetic acid, benzidine is changed to a deep purple compound by the action of blood.

The benzidine test for blood may be applied as follows: To about 5 c.c. of a saturated solution of benzidine in alcohol or glacial acetic acid, an equal volume of 3 per cent. hydrogen peroxid solution (solution of hydrogen peroxid, U. S. P.), is added and then 1 c.c. of the solution to be tested. If the mixture is not acid, it is made acid with acetic acid. A green or blue color indicates the presence of blood. A control test in which water is substituted for the liquid under examination should give no coloration. A number of modifications of the test have been proposed. The test is said to detect blood in a dilution of 1 in 300,000. Many substances lessen the sensitiveness of the test, but do not inhibit it (tannin prevents it).

Benzidine is a grayish crystalline powder, melting at 127.5 C. to 128.5 C. It is almost insoluble in cold water, more soluble in boiling water, but readily soluble in alcohol and in ether.

Benzidine is dibasic, forming salts which, when soluble, are hydrolyzed by water. Benzidine dihydrochloride is quite soluble in water, but requires that its solutions contain free acid to prevent precipitation of the benzidine monochloride. Benzidine sulphate is slightly soluble even in hot water.

If 0.1 gm. benzidine be dissolved in 1 c.c. concentrated acetic acid (specific gravity 1.064) and 10 c.c. solution hydrogen peroxid (3 per cent.) be added, no color at all or at most a very faint color should develop within three minutes; if a small quantity of blood is now added, a blue color should appear.

Benzidine-Merck (For Blood Test).—A non-proprietary brand complying with the standards for benzidine.

Manufactured by E. Merck, Darmstadt, Germany (Merck & Co., New York).

Occult Blood Test (Dudley Roberts).—This consists of tablets each containing 5 grains of a trituration of benzidine, 1 part, and sodium perborate, 20 parts, and glacial acetic acid (supplied in boxes containing 100 tablets in vials, and a bottle of glacial acetic acid).

Actions, Uses and Dosage.—A tablet is placed in a small saucer or other suitable container; to it is added a quantity of the material to be tested (a weak solution of the stool or stomach contents, or urine), sufficient to wet thoroughly, but not to cover the tablet entirely, and then a drop or two of the acetic acid is allowed to fall on the tablet; if blood is present the tablet will turn greenish blue, the extent of the coloration and the time of its development depending on the amount of blood present. (To avoid contamination of the glacial acetic acid remaining in the bottle, care should be taken not to touch the tablet or specimen with the rod which is used to transfer the acetic acid for the test.)

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SATURDAY, SEPTEMBER 16, 1916

NEW OBSERVATIONS ON THE PINEAL GLAND

In a recent review of the current opinions of the function of the pineal gland, attention was directed to some of the conflicting and negative evidence on the subject.[1] The pineal body undergoes a normal, physiologic atrophy at the time of puberty. This fact, taken in connection with older observations in cases of tumor of the gland occurring before puberty which have been associated with a marked precocity in the realm of both primary and secondary sexual characters, has supplied the basis for one theory of pineal function. It assumes that the gland, when physiologically active, tends to inhibit the development of the sexual function. On this hypothesis, interference with the function of the pineal body, either by experimental operative procedure or by the chance of tumor invasion, might accordingly be assumed to remove a natural physiologic restraint and thus permit a prolonged adolescence or exaggerated performance on the part of the organs concerned in sexual, if not in somatic development.

With respect to overfunction of the pineal gland, the only procedure at present available for imitating this possibility consists in administering gland substance to adolescent animals. This has been attempted in a variety of ways with conflicting results. If one accepts the contention that positive results are more suggestive and valuable than negative experiments in this type of investigation, it may be pointed out that several investigators have reported a noticeable overgrowth in the body weight of animals fed with pineal substance or receiving it by other modes of administration.

Underfunction of the pineal body — the condition which might be anticipated to occur with the encroachment of tumors on this organ — ought to be imitable by surgical extirpation of the gland. Any one conversant with the anatomic topography of the region in which it is located will appreciate the very serious difficulties presented by an operation for removal of the pineal body. Dandy's canine pinealectomies were apparently attended with negative results.[2] The latest investigator to undertake work in this field is Horrax,[3] who has made successful extirpations on guinea-pigs and rats. He found that pinealectomized male guinea-pigs show a hastened development of the sexual organs, manifested before maturity by a relative increase in size and weight, both of the testes and the seminal vesicles, over control subjects of the same litter. Histologically the testes and seminal vesicles of these animals, if taken before the age of sexual maturity, show a more advanced physiologic state than their controls. The pinealectomized females appear to show a tendency to breed earlier than controls of the same age and weight. Some evidence of hastened maturity has been obtained with rats also.

Obviously careful control experiments are essential in order to insure conclusions derived from observations of the outcome of surgical interference in regions, such as the midbrain, in which many structures may be damaged incidentally. Horrax very properly asks, Can the changes which have been observed in these experiments be attributed to the loss of the pineal gland, or may they be attributed to some other injury of glandular or nervous tissue? The only other intracranial organ which is known to influence bodily growth and sexual development is the pituitary body, and it is conceivable that, as a result of the operation which has been described, some secondary changes might occur in that structure, due, possibly, to a postoperative hydrocephalus scar formation; but such a condition has never been observed and, furthermore, it would have led to changes the reverse of those we have seen, namely, to skeletal undergrowth and delayed sexual development. Microscopic study of the pituitary in the animals which had been operated on disclosed no departure from the normal.

There is a pathognomonic syndrome in which, coupled with a general bodily overgrowth, the size of the primary sex organs is the most striking feature in the records of the cases. Mental precocity is also a well marked symptom. The phenomena are usually seen in boys before the age of puberty, and at necropsy in all cases a tumor replacing the pineal gland has been found. In the case of the girl, no disturbance of the sexual organs was apparent, adiposity being the only metabolic finding. Horrax remarks that if we are right in assuming that the pineal is a gland, and that its secretion exerts any influence on bodily processes, such evidence as we have would seem to indicate that this influence is exerted on inhibiting physical and mental adolescence. A report of three cases from Cushing's clinic[3] has just been added to the literature. This number of observations, of course, does not permit sweeping deductions on so important a subject. In view of previous indications, coupled with the newer studies on the physiology of the gland in animals,

1. The Pineal Body, editorial, THE JOURNAL A. M. A., Jan. 29, 1916, p. 360.
2. Dandy, W. E.: Extirpation of the Pineal Body, Jour. Exper. Med., 1915, xxii, 2.
3. Horrax, Gilbert: Studies on the Pineal Gland, I, Experimental Observations, Arch. Int. Med., May, 1916, p. 607; II, Clinical Observations, p. 627.

Horrax ventures the impression that sexual ripening occurs when the pineal ceases to be functionally active, or when it is removed, and on this basis he is inclined to the belief that the tumor in most of these clinical cases is associated with an inhibition of the normal products of pineal secretion. If this were really the case, however, one would suppose that glandular feeding would postpone adolescence; but from the observations of Dana and McCord, the reverse seems to occur. It is evident that further investigation of the physiology of the pineal gland is urgently demanded and is likely to yield fruitful results.

THE TARIFF ON DYESTUFFS, AND DRUG PRICES

Owing to the interdependence of dyestuffs and medicinal chemicals derived from coal-tar (the so-called coal-tar synthetics), any conditions influencing the production of the former necessarily are of interest to physicians. Most coal-tar "synthetics" have been developed either in the attempt to create new markets for the intermediate products in dye manufacture, or to utilize the by-products from the color industry. Dyes are extensively used in the cotton, leather, paint, silk, wall-paper and woolen industries, and at the beginning of the present European war, American manufacturers were producing less than 15 per cent. of the quantities used in this country. Of the foreign makers, Germany produced by far the largest amount. In that country the industry had grown to vast proportions, partly as a result of the efforts of manufacturers to utilize the results of chemical research, and especially because of the paternal attitude of the German government toward home industries and the development of trade. After the war broke out, the prices of medicinal chemicals advanced enormously, as may be seen by a few comparisons, the prices being for pounds.

ADVANCE IN PRICES OF MEDICINAL CHEMICALS

Drugs	Price per Pound—August, 1914	August, 1915	August, 1916
Phenol (carbolic acid)	$0.15	$1.50	$0.75
Salicylic acid	0.25	2.00	3.00
Aspirin (acetylsalicylic acid)	6.50	8.80	13.00
Sodium salicylate	0.39	2.00	3.00
Salol	0.75	2.60	6.50
Acetphenetidin	0.80	6.50	30.00
Resorcin	1.05	2.60	24.00
Antipyrin	3.75	15.00	32.00
Phenolphthalein	1.85	5.25	15.50
Methylene blue	1.40	3.25	26.00

It is presumable that these advances in prices have not been made necessary in all cases but that values have been forced up by manufacturers and speculators. For example, phenol (the basis of salicylic acid) is now manufactured here and its price is but half of that of a year ago, yet the prices of salicylic acid and aspirin have advanced. Inasmuch as aspirin is doubtless now made in the United States, presumably from salicylic acid which, in turn, had American-made phenol as a basis, the prices of phenol and aspirin should be parallel.

The revenue bill, which has just been passed by Congress, contains provisions designed to foster and maintain a dyestuff industry in this country. The bill admits parent dye materials and parent coal-tar medicinals free, but assesses 15 per cent. ad valorem and 2.5 cents a pound specific on intermediates, and 30 per cent. ad valorem and 5 cents a pound specific on finished products. The new tariffs become effective at once, but there are provisions for a graded reduction in rates under certain specified conditions. Experience with previous tariffs has shown that, if intermediates are given preferred rates, the goods will be imported so nearly finished that they need but a mere touch for completion, so that the American treasury and American industry both suffer.

The revenue bill also contains an "antidumping" clause. This forbids the sale in this country of imported goods at prices less than those for which they are sold in the country of issue. For years a provision of this kind has been sought in connection with patent legislation but, as passed in the revenue bill, it has broader applications than if applicable only to patented goods.

At present benzene (benzol, C_6H_6), phenol and toluene (the raw products of many dyes) are being manufactured in the United States in large quantities, but owing to the demand for them in the explosive industries, the prices are abnormally high. As soon as the war closes, these products probably will be largely diverted into dyestuffs channels, and prices may be expected to fall. The effect of the tariffs, however, on the cost of medicinal chemicals after the war (discounting speculative features) will be a tendency toward maintaining prices at higher levels than before the war. Under the stimulation of the present high prices and the guarantees of protection after the war, it is to be hoped that American manufacturers will soon produce all of the dyes and coal-tar synthetics needed for home consumption.

SCIENTIFIC INQUISITIVENESS—AN ANECDOTE

In describing the characteristics of a scientific investigator, Liebig once pointed out that certain disciplines, like mathematics, are merely an indispensable instrument for the attainment of scientific ends. He remarked that it is not the mere instrument which plans and executes the work, but the human intellect. It is obvious that without the power of observation, without sagacity, all mathematical knowledge is useless. We may imagine a man who, favored by a good memory, has rendered himself intimately acquainted with every theorem of mathematics and has obtained an eminent degree of skilfulness in handling this instrument, but is altogether unable to invent a problem for solution. If we propose to him a problem, and thus give him the conditions for its solution, he will succeed in obtaining an answer by performing the current operations with which he is familiar, and express

it in a formula consisting of certain symbols, the meaning of which, however, is perfectly unintelligible to him, because he is deficient in other attainments essential for judging of its truth. Such a man is a mere calculating machine. But as soon as he possesses the capacity and the talent of proposing a question to himself and testing the truth of his calculations by experiment, he becomes qualified to investigate nature. For whence should he derive his problems, if not from nature or from life?

The capacity for asking questions which stimulate the spirit of investigation is not a common attainment, even among so-called educated persons. It is a trait which goes hand in hand with the ability to discern unique opportunities and to utilize them in the quest for knowledge. It was with this sort of singular foresight that William Beaumont, "the pioneer American physiologist," recognized the opportunity for scientific discovery that presented itself when Alexis St. Martin received the gunshot wound that transformed him into the subsequently famous man "with a lid on his stomach," and thereby made him a suitable subject for the study of the physiology of digestion.

We cannot refrain from quoting a striking instance of that scientific inquisitiveness and uncommon capacity of formulating a problem which characterized the late S. Weir Mitchell. It serves as an instance not only of the mental alertness of this eminent physician, but also of the acumen which furnishes an opportunity. The incident relates to the days when Mitchell was engaged in his classic researches on the poison of snakes—the subject of subsequent fruitful studies. In an address at the dedication of the Mitchell Memorial Building of the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases, W. W. Keen, who aided Mitchell in the early experiments, relates the story as follows:

> One hot July just after we had collected one or perhaps two teaspoonfuls of the liquid snake-poison in a small cup, Mitchell was called out of town for three or four days. Usually we immediately spread out this liquid in a thin layer so that it would dry quickly before decomposition set in, but by an oversight on this occasion it was left in the cup in bulk, and naturally in such weather underwent quick decomposition. On his return we went to the laboratory and on opening the door were almost knocked down by the horrible stench. Who of us here would not have sought the source of the smell and in all haste have thrown it away? Not so Mitchell. Instantly he turned to me and said, "I wonder if decomposition has destroyed its poisonous character. Let's try it." That was always his desire—to put everything to the test of experiment. A single experiment showed that for a pigeon it was as virulent as ever. How subtle and potent was the poison that even decomposition left intact! But not to every form of life was it even then a poison, for disporting themselves in the cup were a host of nimble little animalculae having apparently the time of their lives.

This is the spirit of the true investigator. Opportunity for service in science comes to most men in the medical profession. Few, indeed, have the vision or the inclination to grasp the favorable chance.

THE ALKALI RESERVE OF THE BLOOD

The neutrality regulation of the body or the maintenance of a certain equilibrium between acids and bases is accomplished by the cooperation of a variety of factors.: In discussing the restitution of basic and acid substances which are used up in the physicochemical equilibriums of neutrality, L. J. Henderson has pointed out that this may be both exogenous and endogenous.[1] He notes that there is an exogenous restitution, which depends on the presence of large amounts of unchangeable basic and acid substances in the food. This process is ordinarily left to chance and a mixed diet, but in case of need may be usefully controlled. The investigation of Blatherwick[2] on the diet illustrates this possibility, while the value of soda when administered in acidosis is a more familiar instance. The endogenous restitution involves the necessary and, in normal metabolism, unvarying production of carbonic acid, phosphoric acid, sulphuric acid and other substances, and secondly the very variable manufacture of ammonia instead of neutral material, during the course of nitrogenous metabolism. The latter process is not well understood. In such conditions as diabetic acidosis a large increase in the production of ammonia is perhaps the chief means of prolonging life; but on the other hand there are also conditions of acidosis in which the production of ammonia is actually diminished below the normal amount.

The part played by the stored alkali of the organism in these regulatory phenomena has attracted special attention of late. It has been said that the constancy of alkalinity is quite the earliest and most universal physicochemical regulation of active protoplasm. Modern investigations by Palitzsch show that the ocean itself is likewise constant in its alkalinity. "In the course of long experience with the problems of acid-base metabolism a conviction has gradually been established in my mind," Henderson writes, "that such reserves of alkali, in substantial amounts, must exist and not infrequently suffer mobilization." The blood itself, which is the immediate seat of important acid-base regulatory reactions, maintains an efficient alkali reserve. In the plasma it is constituted by bicarbonates and alkali protein compounds, together with small quantities of alkali phosphates. Under normal conditions these substances are present in very constant quantities.

In a recent study of the alkali reserve, Marriott[3] describes acidosis as a diminution of this reserve which may be recognized by a variety of clinical symptoms and by characteristic alterations in the composition of the blood, urine and alveolar air. Under this definition

1. Henderson, L. J.: The Excretion of Acid in Health and Disease, Harvey Lectures, 1914-1915, Series X, Philadelphia, J. B. Lippincott Company, p. 132.
2. Blatherwick, N. R.: The Specific Rôle of Foods in Relation to the Composition of the Urine, Arch. Int. Med., September, 1914, p. 409.
3. Marriott, W. McK.: A Method for the Determination of the Alkali Reserve of the Blood Plasma, Arch. Int. Med., June, 1916, p. 840.

acidosis implies a diminution of the alkali reserve of the blood plasma, though not necessarily a change in its hydrogen ion concentration. Marriott gives this lucid picture of the regulatory reactions: the alkali reserve maintains the plasma at a constant slightly alkaline reaction, despite the fact that acid products of metabolism are continually being poured into the blood. Chief among the acid products, so far as total quantity is concerned, is carbonic acid. An almost infinitesimal change in reaction in the direction of acidity occurs. This slight change is sufficient to stimulate the respiratory center. The resultant pulmonary ventilation removes the excess of carbon dioxid, and the plasma reaction returns to its original point. An excessive production of carbon dioxid in the tissues results in a greater change in the reaction of the plasma, with a consequent increased stimulation of the respiratory center and increased pulmonary ventilation. This tends to accomplish the removal of the extra carbonic acid. No depletion of the alkali reserve occurs. If, however, a nonvolatile acid, such as sulphuric, phosphoric or beta-oxybutyric, is poured into the plasma, a certain amount of the alkali reserve is neutralized, and the reaction of the plasma shifts toward acidity. Increased pulmonary ventilation occurs, but this, of course, cannot effect removal of the nonvolatile acid. An extra amount of carbonic acid can be removed, however, so that less than the normal amount remains in the plasma. This decrease in carbonic acid may compensate for increase in nonvolatile acids, and the reaction may return to the normal point. The alkali reserve, however, is depleted, as it is partially neutralized by the nonvolatile acid. When the plasma with its depleted alkali reserve again comes in contact with the tissues the carbonic acid normally produced causes a greater change in reaction than when the alkali reserve was intact. As a result there is an overstimulation of the respiratory center, the evidences of which are hyperpnea and a diminished alveolar carbon dioxid tension. If the increased pulmonary ventilation is sufficient to maintain the carbonic acid content of the plasma at a low enough level, no appreciable change in reaction occurs. If, however, the alkali reserve is not replenished and if acid continues to pour into the plasma, a time may come when the increased pulmonary ventilation can no longer compensate by removal of carbonic acid. In such an event, the reaction of the circulating plasma becomes constantly less alkaline until a point is reached which is incompatible with life. This point is, approximately, neutrality.

It is thus evident that the estimation of the alkali reserve in the plasma or its depletion may be of decidedly greater interest than the measurement of the reaction, since it is only in severe acidosis that a change in the latter occurs. For ascertaining the reserve alkalinity, Marriott has devised a new method.[3] In a series of cases including nephritis and diabetes in adults, recurrent and idiopathic acetonemia, and severe diarrheas in children, all of which patients exhibited clinical or laboratory evidences of acidosis, the reserve alkalinity of the blood serum showed deviations from the normal. The more severe the acidosis, judged by the clinical symptoms, the lower were the figures obtained. Especially striking was the parallelism between alveolar carbon dioxid tension and the reserve alkalinity. The latter always shows an increase after the administration of alkalies, but does not necessarily reach its normal value. The new method has a value that will be appreciated by many therapeutists, in that it gives information as to the probable amount of alkali needed to replenish the reserve. A determination following the administration of alkali shows whether or not the amount has been sufficient. Above certain analytic values that have been ascertained by experience, the acidosis may be successfully combated by dietetic regulation or by the administration of alkali by mouth; when the alkali reserve falls lower, intravenous administration of alkali is usually indicated. Thus every new experimental method of value paves the way for possible improvements in either medical diagnosis or therapy or both.

ANTIMONY IN FOODS

Poisoning of mysterious origin is doubtless more common than is generally appreciated. By this we do not refer to the obviously profound effects of large doses of highly deleterious compounds, but rather to the more subtle intoxications of a mild grade which often escape notice because of the unexpected ways in which they may arise. Industrial poisonings are occasionally of this character. Recently we called attention to the possibilities for harm in the accidental employment of daffodil bulbs as food.[1] Some time ago the warning of the Hygienic Laboratory of the United States Public Health Service against the use, for milk bottles, of rubber nipples containing antimony was mentioned.[2] Recently unexpected possibilities of harm have been detected in some of the enameled cooking utensils that are sold in American markets.[3]

When these dishes first began to supplant crockeryware, considerable agitation arose in Europe regarding the possibility of lead poisoning from food prepared in dishes highly glazed, because this metal is employed in the arts in which glazing is carried out. In the case of sheet steel enameled ware, for which a glaze of great brilliancy is not required, it has been possible to use other substances to act as a flux. It is now widely believed that lead is not used in the manufacture of popular enameled dishes. Investigations by

1. Poisonous Properties of the Garden Daffodil, Current Comment, THE JOURNAL A. M. A., July 22, 1916, p. 290.
2. Bull. 96, Hyg. Lab., U. S. P. H. S., 1914, p. 56. Rubber as a Source of Hygienic Danger, Editorial, THE JOURNAL A. M. A., Nov. 28, 1914, p. 1954.
3. Miller, Elizabeth W.: The Solution of Antimony from Enameled Cooking Utensils, Jour. Home Econ., 1916, viii, 361.

Miss Miller[3] at the University of Chicago indicate that this element was liberated in exceptional cases only, by vigorous cooking tests with enameled dishes of standard make.

Not so with antimony, however. This relatively cheap substance has long been added to certain enamels to make the glaze opaque. Usually tin oxid is employed. Arsenic is said to be used only in enamels for decorative purposes. Presumably enamels containing antimony can be made so resistant to mild chemicals that practically none of the poison will dissolve in the ordinary cooking process. Nevertheless some of the European countries have forbidden the use of antimony in culinary utensils. No such prohibition exists in America. Miss Miller has recently found that some antimony was dissolved in every case after cooking various foods in cheap gray enameled kettles purchased in certain stores where the poorer classes trade. As an illustration of the quantities liberated in this way, acid substances like grape juice, cider and cranberries acquired from 3 to 14 mg. during a cooking test. A serving of spinach incorporated nearly 10 mg. of antimony from a small dish. Even fresh milk dissolved out 3 mg.

Various factors seem to influence the amount liberated. The acidity of the foods, the number of times the dish has been used, the amount of abrasion in the culinary process, temperature, and a time factor doubtless all play a part. Miss Miller remarks that the fact that one make of enamel is so readily attacked as to betray its inferiority by the abrasion produced would probably prevent its use by intelligent persons; but the less intelligent might adopt it without question. The toxic dose of antimony is not so large — the average dose of tartar emetic contains only 5 mg. of the element itself — that its introduction into foods through the medium of cooking utensils can be overlooked. Further investigation is desirable in the interest of public health.

Current Comment

FISH MEAL AS A STOCK FOOD

It has been asserted that of all the fish which swim the seas the most valuable American food fish is the menhaden; but no American eats of its flesh. This paradox finds its explanation in the fact that the menhaden is one of the principal foods of the vast shoals of cod and other fish which frequent the northeastern coasts, and that it is caught in enormous quantities for the sake of its oil. The residues, after the removal of the latter, are ground up and used as fertilizer. This fish, therefore, in two ways, becomes indirectly an important food source. Fish residue fertilizer products are also obtainable from the refuse of the sardine and salmon canning industries. The nitrogenous and mineral content (phosphoric acid) of fish meal is high, but presented in a form in which the manurial properties are very slowly developed in the soil. Yet, if this fish meal could be fed to live stock, the whole of the nitrogen and phosphorus would be rendered available either as meat or in a readily assimilable form as manure. The use of such products as a part ration for live stock dates back a great many years, and is quite thoroughly organized in Germany. The whole question has been submitted to experimental investigation by the Department of Agriculture, and the result is published in Bulletin 378.[1] The conclusions are that fish meal is as valuable as other widely used high protein feeding stuffs, and in some instances has been proved more valuable than these; that it does not impart its flavor to animal products if fed in reasonable amounts in conjunction with other foods, and, finally, that it should be given consideration whenever a high protein foodstuff is required.

AS DRUGGISTS SEE IT

"One advantage, to the manufacturer, of putting up preparations according to a secret formula is that he can put in or leave out any ingredient he chooses, as the condition of the market, his respect for the law, or other circumstance may dictate. Indeed, he may take an entirely different thing and continue to sell it under the old name and to boost it with testimonials written for the old preparation. This is done right along. Just to what extent such action is fraudulent and just how much of the responsibility for the fraud rests upon the retailer are questions which might be thought over by the latter."

Another vicious attack from the self-seeking doctor! Another bit of vituperation from the "Medical Trust." No! On the contrary, it is from a magazine published in the interest of pharmacy and the drug business — the *Druggists Circular*. But THE JOURNAL could not have said it better. It is a pleasure to quote from a drug journal that really represents the decent druggists of the country. Unfortunately, there is a noisy group of magazines that are called drug journals which are but the mouthpieces of the "patent medicine" interests. Because of their publicity methods, journals of the latter type have obtained a hearing that is all out of proportion to their importance. The science and art of pharmacy have suffered accordingly. If venders of secret remedies would read the *Druggists Circular*, they would learn what decent druggists think of their business.

THE DOCTOR WITH WRITER'S CRAMP

"Dr. Scribbler, Chicago, office hours 9-11, 1-3, 7-8," read his card. He was just a general practitioner with an average practice. Quite frequently there would be three or four persons waiting in his office. One day in September, 1916, he arrived promptly at 9, and the sight which greeted his eyes almost caused him to faint. The waiting-room was full. It was a case of "women and children first," however, for there was not a man in the place. Before Dr. Scribbler's eyes there passed visions of a season ticket for the opera, the new fur coat his wife wanted, the last payment on the mortgage, and his next insurance premium — and

1. Fish Meal: Its Use as a Stock and Poultry Food, Bull. 378, U. S. Dept. Agric., Aug. 22, 1916.

a lot of other little indebtednesses which he was expecting or wanting to meet. So he sat down at his desk and said, "Who's first, please?" Mrs. Jones came in with Johnny, aged 9, Mary, aged 11, and Susie, aged 13. "It must be an epidemic," thought Dr. Scribbler. "Doctor," said Mrs. Jones, "I can't send the children to school without a health certificate. The papers say that you are to give them to us free." Gone were the visions of luxuries and paid-up necessities. The doctor questioned the mother closely as to the children's past activities, examined each child's throat, nose, ears, skin and reflexes, and wrote out a certificate for each. By this time the congestion in the waiting-room had increased tremendously. The doctor took off his coat, refilled his fountain pen, and called for the next lot. By 12 — he had worked right past the 11 o'clock hour — he had examined 150 children. At 12:30 the examination had assumed this form: "Where've you been last three weeks? Anybody sick near your house? Open your mouth; say 'Ah.' That's all." And he wrote another certificate. By 8 p. m. he had examined — save the mark — 400, and his total income was $0.00. He stepped out into the waiting room and addressed the remaining applicants, "You will have to come back tomorrow." Just then a man entered. "Come right in, Mr. Smith," said Dr. Scribbler. "Doctor," said Smith as he walked into the office, "I have to collect some accident insurance, and the company sent me these blanks and said you will fill them out for me free." When they examined Dr. Scribbler at the hospital, an hour later, the diagnosis was "acute shock superinduced by writer's cramp."

PLAYING TO THE GRANDSTAND

"Grandstander" is a term of more than mild reproach used to characterize the athlete who plays his game in showy fashion with an eye to the plaudits of the onlooking multitude. In football, he is always limping after a tackle; in baseball, he is excessively active, making unnecessary motions and attempting to cover ground he was never meant to cover; in golf, he adjusts his tee with a nicety which can have no effect on the distance of his drive, and if he "slices," the "gallery" is indulged with an exceedingly technical discussion of just how it happened. No one is so inclined to "grandstand" as the American officeholder or public official. The medical aspects of the matter are being displayed in the present epidemic of infantile paralysis. The measures employed by some officials to stay the progress of the epidemic, while apparently logical in every instance, at times impress the average observer as being merely an attempt to play to the grandstand. In some communities the health officers appear daily in interviews in which they call attention to their immense activities in preventing the spread of the disease. Every move is chronicled in the newspapers, and press notices are sent to those papers which fail to interview the official personally. Commissions are appointed to investigate when there are no funds for such purposes, and in some instances when there are not enough cases to form a respectable basis for an investigation. Frequently a "grandstander" in athletics is rewarded merely by the hisses of those whose encomiums he seeks. It would not be strange if a similar fate should befall some of those public officials who carry the unsportsmanlike attitude of the "grandstander" into the care of the public's health.

PREVENTION OF ABORTION

Congress has voted an appropriation of $50,000 for the investigation and control of abortion — but it is a disease of cattle and not of man that is to be investigated and controlled, and the undertaking is under the direction of the Bureau of Animal Industry. Why not appropriate $50,000 for the investigation and control of abortion among human beings, and let the Public Health Service do the work? There is certainly every year a sufficient number of undesired and unplanned abortions, and a sufficient number of desired and planned abortions which would never be consummated, were the possible consequences known, to justify such an effort.

LIGHT PRODUCTION IN ANIMALS

The firefly, with its intermittent glowing, has always been regarded with wonder by all children and many adults. Years ago it was found that the dried luminous organs of the firefly will glow if moistened with ordinary water, but that no light is emitted if the oxygen is removed, as by boiling the water. In 1884, Raphael Dubois of the University of Lyons, working with *Pyrophorus noctilucens*, the West Indian fire-beetle, demonstrated that there were two substances present in the luminous organs, one a thermostabile substance, luciferin, and the other a thermolabile enzyme, luciferase. He stated that luciferin was an albumin having acid properties and an active reducing power. It was oxidized readily with luciferase, potassium permanganate, peroxids, etc., giving off light and forming amino acids. Luciferase, on the other hand, had all the properties of an oxidizing enzyme. The work of Dubois has recently been confirmed by Harvey,[1] who studied *Pyrophorus*, the eastern American fireflies, *Photinus* and *Photuris*, and luminous bacteria. Harvey states that there is no doubt as to the existence of luciferin and luciferase, although he was unable to isolate the latter from luminous bacteria, probably because it occurs in an endo-enzyme. He finds that luciferase of one form will act with luciferin of another form, and vice versa. Whether or not all forms of luciferin and luciferase, respectively, are identical, is debatable. A luminous reaction which parallels animal light production may be made by taking an almost inconceivably small concentration of pyrogallol in water (1:254,000), adding first some vegetable oxidases (potato or turnip juice), and then some hydrogen peroxid. The pyrogallol plus hydrogen peroxid corresponds to luciferin; the vegetable oxidase corresponds to luciferase. In the fore-

1. Harvey, E. Newton: The Mechanism of Light Production, Science, Aug. 11, 1916, p. 208; Experiments on the Nature of the Photogenic Substances in the Firefly, Jour. Am. Chem. Soc., 1915, xxxvii, 397.

going action, mammalian blood may be substituted for the plant juices. Although there is much work to be done, especially from a chemical standpoint, to prove it, yet the phenomenon of bioluminescence in the firefly appears to be simply an unusual enzyme reaction.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DISTRICT OF COLUMBIA

Poliomyelitis in the District.—Four new cases of poliomyelitis were reported during the week ending September 9, of which two were the result of infection outside the District.

Opening of Schools Postponed.—Notwithstanding a report from the health officer that such action was not necessary, the board of education has postponed the opening of the public schools from September 18 to October 2 on account of poliomyelitis. The health officer reported that poliomyelitis had prevailed in the District to a relatively slight extent, that both knowledge and experience with respect to the disease indicated that the decline that had already begun would continue, and that there was no evidence to show that the disease was spread through school attendance.

Appointments to be Made in the Health Department.—Search is being made for the most available persons to fill two offices in the health department created by Congress in the appropriation bill enacted September 1. Appointments will be made, it is stated, without reference to residence in the District, in order to get the most efficient service. A chief medical and sanitary inspector is to be appointed, who, under direction of the health officer, is to give his whole time to, and exercise direction and control of, the medical and sanitary conditions of the public schools, at a salary of $2,500 a year. He will assume charge of the thirteen medical inspectors and five graduate nurses now in the service. A chief food inspector, at $1,800 a year, is authorized by the appropriation act, to have general supervision and control of the food inspection service, comprising seventeen subordinate inspectors.

Tuberculous Persons to be Excluded from Schools.—The attendance at public or private school of any person suffering from any communicable form of tuberculosis, either as a pupil, teacher, janitor, or helper, except at schools maintained solely for the instruction of tuberculous pupils, is forbidden by a regulation promulgated by the commissioners of the District, to take effect October 1. There is no school in the District maintained for the instruction of such pupils, but it is hoped that the promulgation of this regulation will lead to the establishment of classes for them. As indicating the need for this regulation and for the establishment of such classes, the health officer pointed out that in November, 1915, the records of the health department showed 127 children suffering from communicable forms of tuberculosis and in attendance at school, and that during 1915 there were reported 114 new cases among persons between 5 and 20 years of age.

ILLINOIS

Personal.—Dr. Ernest M. Ewers, Apple River, recently of San Juan, P. R., sails from San Francisco, October 7, to take up work in a hospital in the Orient under the Presbyterian Board of Foreign Missions.——Dr. Charles C. Peck, Harvard, is a candidate for renomination as coroner of McHenry County.——Dr. William M. Hanna, Aurora, was elected surgeon-general of the Grand Army of the Republic at its recent encampment in Kansas City.——Dr. Ira O. Paul, Winnebago, announces his candidacy for coroner of Winnebago County.

Chicago

Asks Appropriation for Poliomyelitis.—Health Commissioner Robertson has asked the school board to appropriate $15,000 for laboratory work in connection with the medical inspection of schoolchildren.

Doctors' Fees Held Up.—The bills of eight physicians who have served on boards for the examination of feebleminded persons have been reduced by the board of county commissioners in one instance from $170 to $5; and in others from $265 to $30; $60 to $5; $105 to $15; $45 to $5; $40 to $5, and $110 to $30.

Personal.—Dr. Albert E. Halstead has been asked to take charge of a French base hospital on the west front.——Dr. Christian B. Luginbuhl has been appointed surgical attaché to the American Legation, Berlin.——Dr. P. J. H. Farrell is a candidate for congress from the ninth district on the Democratic ticket.

Typhoid at Pumping Station.—It is reported that three employees of the Sanitary District of Chicago have died from typhoid fever during the last week and that three other cases have occurred, all traceable to infection at the Lawrence Avenue pumping station, where the hygienic conditions are said to be deplorable.

Children Must Have Certificates.—By joint action of the board of education and the commissioner of health, all pupils on entering school this fall must present certificates from authorized physicians that said pupils have no contagious or infectious disease and have not been exposed to any such disease within two weeks. Medical school officers will examine pupils having no certificates, and physicians at large have been asked to cooperate by giving their services where needed. The kindergartens of the public schools are not to open until after September 29. This measure is taken as an added guard against further increase of infantile paralysis or other contagion.

MARYLAND

Personal.—Dr. William A. Frontz of Johns Hopkins Hospital has been commissioned as major in the Royal Army Medical Corps, and has gone to France as a member of the Harvard unit.

Infantile Paralysis.—During the past week six new cases of infantile paralysis were reported to the city health department, and there were four deaths. The state board of health received a report of a positive case of infantile paralysis in Dorchester County from Dr. Lyle L. Gordy of Cambridge. The quarantine on several houses at Thistle Mills, near Catonsville, has been raised by the state board of health. The first case of the disease to appear in Catonsville was reported during the week, but it is thought the child contracted the disease while on his way home from North Carolina.

MASSACHUSETTS

Personal.—Dr. Albert B. Toppan, attached to the quarantine station at Balboa, Canal Zone, is visiting his parents at Parker River.——Dr. Fred M. Spalding, Boston, has been elected president of the Asquam Lake Fish and Game Association.

Infantile Paralysis.—During August there were 255 cases of infantile paralysis reported in the state, with thirty-three deaths, North Adams heading the list with eight deaths, Boston following with seven.——The opening of the schools of Medford has been delayed until September 26 on account of the prevalence of infantile paralysis.

Quarantine Station to be Sold.—It is reported that the mayor of Boston has come to an agreement with the assistant secretary of the treasury whereby the federal government will pay $150,000 for the quarantine station at Gallup's Island, Boston Harbor. The formal transfer of the quarantine was made through the federal health authorities, June 1.

Pediatrists Meet on Hospital Boat.—Sixty-five physicians connected with hospitals and dispensaries of Boston met at the invitation of Dr. Henry I. Bowditch, Boston, on the floating hospital, August 23. A meeting was held at which fifty selected cases treated by the hospital during the season were discussed and a paper was also given by Dr. Wilson G. Smillie, Boston, on "Infectious Diarrhea and Dysenteries." August 23 was the record day of the season for the floating hospital, when 303 patients were cared for.

NEW YORK

Advice to Summer Residents Returning to City.—Dr. Hermann M. Biggs, in response to numerous requests as to the advisability of summer residents returning to New York and other places where infantile paralysis is still prevalent, suggests that children be not brought back, unless it is impera-

tively necessary, until there is indisputable evidence that the active spread of the disease has ceased. Such a time, Dr. Biggs is quoted as saying, may be set not earlier than October 1. Up to September 8, there have been 2,520 cases of infantile paralysis reported to the state health department, with 268 deaths.

New York City

Quarantine Against Cholera.—The Ward Line steamship *Monterey* and the Spanish liner *Montserrat* which arrived recently from Vera Cruz were detained in quarantine while their passengers, sixty-seven in number, were sent to Hoffman Island for observation for twenty-four hours. This step was deemed necessary in view of the report that cholera has broken out in Vera Cruz and several smaller Mexican ports.

Domestic Animals and Poliomyelitis.—Visiting nurses of the health department have been instructed that in visiting cases of poliomyelitis they shall make special inquiry regarding animals. If they find anything suspicious they report the matter immediately and the suspected animals are removed by the health department for observation. A veterinarian then examines the animal and if he finds the suspicions justified the animal is killed and a careful examination made. A veterinarian also visits the shelter of the Society for the Prevention of Cruelty to Animals to see if there are any suspected cases of animal infection.

Diabetes Research.—Under the special George Blumenthal scholarship of $900 in the School of Medicine of Columbia University, Dr. H. Rawle Geyelin has made distinct additions to the knowledge of diabetes along clinical lines. This work has developed into a special clinic and Dr. Geyelin has been given an academic appointment as assistant. In addition to this scholarship there have been three undergraduate scholarships established during the last two years, and in the coming year there will also be a fourth. The students who receive these scholarships work as special assistants in the laboratory and are used as assistants in laboratory teaching.

Infantile Paralysis.—According to the records of the health department there have been, to September 9, 8,486 cases of infantile paralysis, with 2,100 deaths. The daily average of cases during the first week of September has been slightly under fifty, ranging a little higher for the excessively warm days. As was noted some time ago, the death rate has been somewhat higher than earlier in the epidemic, having advanced from 20 per cent., which was considered unusually large, to 41 per cent., with an average of about 25 per cent. ——Announcement is made that Ward G. Crampton, director of hygiene, physical training and athletics in the public schools, has conferred with the health commissioner with a view to securing the cooperation of the departments of education and health for the purpose of formulating a program for the instruction of the public school teachers with reference to the prevention of infantile paralysis during the teachers' institute.——Mention has before been made of the effort of the health department to secure donors who have had infantile paralysis and who are willing to give blood to supply serum for the treatment of those having the disease. This appeal has been again emphasized. It is stated that up to the present time the amount of serum thus obtained has been only a fraction of what could well be used in the treatment of patients now entering the hospitals. If such individuals will communicate with the health department either by telephone or letter all arrangements will be made by the department for collecting the blood either at the laboratory of the department or at the donor's home.——The daily press announces that the Brace Fund is growing apace, and now amounts to something more than $31,000.

Pay Clinic.—The following opinion has been rendered by the attorney-general of the state on this subject at a request of the Medico Economic League:

> You state that you are informed that certain large charitable institutions of this city contemplate the establishment of night pay clinics for medical and surgical treatment of persons, on a general basis of One Dollar per visit. This is a matter which may be considered when occasion arises. Unless facts are presented showing the character of the dispensary and the manner of fixing the charge and the disposition of such funds, it is impossible to pass upon the question.
>
> I have no hesitancy in stating, however, that a charge even of One Dollar, if made in accordance with the provisions of Section 290, by a dispensary which fully complies with the standards, requirements and purposes of Section 291 of the State Charities Law, would be lawful.
>
> Whether a person who pays One Dollar for treatment at such a dispensary is a proper object of charity, depends entirely upon the circumstances in each individual case. If all that patient can afford to pay is One Dollar, and he may obtain treatment by a specialist for that amount at a dispensary, while treatment by the same specialist at the patient's home or the physician's office would be entirely above his means, I do not see why such patient cannot avail himself of the services of such specialist. There are many physicians and specialists of great skill and high professional standing who give time to dispensaries to treat just such cases. It is their generous contribution to the general welfare of the community. The advantage of a dispensary is that the patient will there find a coordinated group of specialized physicians, surgeons and pathologists, working together in a comprehensive organization.
>
> I see no danger of the use of dispensaries being abused by persons who can afford to pay the full quota of specialized surgical or medical treatment, for Section 296 of the State Charities Law provides that:
>
> "Any person who obtains medical or surgical treatment on false representations from any dispensary licensed under the provisions of this article, shall be guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than Ten Dollars, and not more than Two Hundred and Fifty Dollars."
>
> I feel that dispensaries of the standard conducted by the institutions named by you should be encouraged and assisted, rather than hampered and hindered.

PENNSYLVANIA

Municipal Hospital for Reading.—The Driscoll farm, north of Reading, has been purchased by the city for a municipal hospital. The price paid for the property was $30,000.

Diphtheria in Conway.—There are so many cases of diphtheria in and around Conway that the health and borough authorities have appealed to the state health department to intervene and assist in stamping out the outbreak.

Personal.—Dr. Charles E. Roderick, pathologist at the Hazleton State Hospital, has resigned to become laboratory superintendent for the Florida State Board of Health.——Dr. David Earl Hemphill, Tarentum, has been commissioned first lieutenant, N. G. Pa., and assigned to the First Ambulance Company, Pittsburgh.——Dr. Fred E. Weddingen has been appointed city bacteriologist of Williamsport.——Dr. Oliver H. Fretz has resigned after twenty-three years' service as president of the Quakertown Board of Health.——Dr. Andrew B. Gloninger, Lebanon, has been mustered out of the United States Service.——Dr. Samuel H. Gilliland, for seventeen years connected with the Alexander Vaccine Farms, Marietta, has resigned from the biologic laboratory of that institution.——Dr. Edward S. Dickey, Pittsburgh, has returned after several months' service with the Russian army.

Philadelphia

Club Outing.—The Medical Club of Philadelphia held an outing on the Delaware River, September 11, on the steamer *Queen Anne*, which left the Arch Street wharf in the afternoon, returning about 10 o'clock.

Baby Death Rate High.—Despite extensive plans made early in the summer to save the lives of babies there were more deaths of infants in July than during the same period of last year. The number of children ranging in age from 1 day to 1 year who died during July, 1915, was 701, but this year 1,050 babies died.

Personal.—Dr. Charles K. Mills has been appointed consulting neurologist to the Hospital for Contagious Diseases. ——Dr. Amin M. Saleeby has returned from Greece.——Dr. William Henry Furniss III, who went abroad, July 1, on a mission for the Emergency Aid in Philadelphia and who was taken ill, is reported to be improving.

Infantile Paralysis.—The epidemic of infantile paralysis in Philadelphia shows no sign of abatement. Ten more new cases were reported on September 9, and this makes the total of 649 cases since the epidemic began. Three deaths were recorded in the previous twenty-four hours, making the total number of deaths 197. The death rate for the disease per thousand in Philadelphia is 30.36, in New York the rate is 24.76 and in Camden is 30.01. Camden reported one new case on September 9, making a total of fifty-four cases since the epidemic began, with sixteen deaths. The disease is widespread throughout the city and has not been limited to any special sections. Several adults as well as infants have contracted the disease and died. The schools of Philadelphia will be closed until October 2, the only exception being college classes, and the third and fourth high and special classes in St. Joseph's College. These will open on September 18. Immune serum has been used to a considerable degree in the treatment of the disease in the Municipal Hospital. Reports given out claim that the serum has a specific influence but no official statements have been issued. The number of new cases reported for September 9 throughout the state of Pennsylvania totaled eleven. Dr. Samuel G. Dixon, health commissioner, claims that any attempt to suppress reports of cases of the disease will be dealt with severely by the health authorities. It has been stated that on several occasions the disease has been concealed in order to protect families from quarantine.

SOUTH CAROLINA

Personal.—Dr. James E. Daniel, Greenville, who has been serving for more than a year in the American Woman's War Hospital, Paignton, Devon, sailed from Liverpool on his return, August 12.——Dr. Le Grand Guerry has been elected president, and Dr. Pinkney V. Mikell, vice president of the Columbia Hospital Association.

Health Officers Meet.—A state federation of health officers was organized at a meeting called at the Isle of Palms, August 21, by Dr. James A. Hayne, Columbia, secretary of the state board of health, at which thirty-nine delegates from the state board of health and various county and city boards of health were present. The following officers were elected: president, Dr. Charles E. Low, Spartanburg; vice presidents, Drs. Davis Furman, Greenville, and J. Merceir Green, Charleston, and secretary, Dr. Marion R. Mobley, Florence.

TEXAS

Camp for Tuberculosis Patients.—It is expected that the city of Houston will donate a site for a camp for tuberculosis patients and that Harris County will cooperate with the city in providing the buildings for this purpose. About ninety persons who have tuberculosis have appealed to the Houston Foundation for relief.

Personal.—Prof. Carl T. Dowell, instructor of chemistry at the University of Texas, Austin, has been elected associate professor of chemistry at Tulane University, New Orleans, and was given a farewell recently by the faculty and students of the University of Texas.——Dr. William E. Spivey, Belton, has been appointed a state quarantine officer with station at Brownsville.

State Board of Health Topics.—At the recent quarterly meeting of the state board of health infantile paralysis was made a notifiable disease, as provided by the State Sanitary Code. It was decided that health certificates be required from persons under 16 years of age desiring to travel from infected points. Rules similar to those adopted at the Washington Conference as to the handling of the disease were passed.

CANADA

Hospital News.—The new Convalescent Hospital for returned soldiers in the old building of Knox College, Toronto, is rapidly drawing to completion and will be opened in another ten days. The hospital is furnished with beds and equipment throughout. The whole of the furniture has been given by private individuals and societies in Toronto, and the hospital will be one of the best equipped in Canada.

More Medical Officers Wanted.—The Canadian Army Medical Corps doing duty overseas is in need of more officers to cope with the rapidly increasing work. A call has been received in Toronto for more volunteers and until the required number has been received no further drafts into the R. A. M. C. will be permitted. All offers of medical practitioners who are qualified will be accepted and taken on the strength of the local C. A. M. C. unit, and then given as much training as possible. Applicants are to apply to the A. D. M. S., Camp Borden, Ont.

Personal.—Capts. Clarence Woods Johnston, C. A. M. C., Manitou, Man.; William Jonas McAllister, Calgary, Alta.; John Bruce McGregor, Winnipeg, Man.; Albert Ross, Blue Mountain, N. S.; Frederick James Tees, Montreal, Que., and Herbert William Wadge, Winnipeg, Man., all of the same service, have been decorated by the king with the military cross. Johnston established a new dressing station under terrific fire, working continuously for three days, and evacuated his wounded with complete success. McAllister was very devoted to duty under very heavy shell fire. His work at all times is described as splendid. McGregor cleared all his casualties under great difficulties and was regardless of personal danger in carrying out his duties. Ross continued to dress and attend to the wounded after all dugouts had been blown in, and attended to wounded in open trenches. Tees led his bearers to exposed positions under heavy shell and machine gun fire, and evacuated all his wounded. Wadge dressed and evacuated wounded for four hours in an advance dressing station under intense bombardment and then succeeded in evacuating all with extreme danger and difficulty. ——Dr. E. O. Hovey, who is in command of the Grenfell Mission schooner, which in July, 1915, went to the relief of the Donald B. MacMillan Arctic Expedition, decided to remain in northern Greenland for a time along with other scientists of the expedition. The schooner has returned to Battle Harbor, Labrador.——Word has been received in Woodstock, Ont., from Dr. Samuel McM. McLay, who went to England when the war began for graduate work. He accepted a chance to join the R. A. M. C., and has been serving ever since. About three weeks ago he returned to England wounded. He was working in a dressing station at the front in France when the enemy got range of the station, killing every occupant except Dr. McLay. Even the man on whom he was working at the time was blown to pieces.

GENERAL

Ohio Valley Physicians to Meet.—The annual meeting of the Ohio Valley Medical Association will be held in Evansville, Ind., November 15 and 16.

Personal.—Senate bill 3180, which passed the Senate, August 29, authorizes the appointment of Dr. Clarence C. Kress to the grade of captain, Medical Corps, U. S. Army.

New Head for Red Cross.—Elliot Wadsworth, a lawyer of Boston, was elected vice chairman and executive head of the American Red Cross at a special meeting of the executive committee, August 23.

Adventists Advocate Medical Inspection.—At the Adventists Camp held in Hastings, Neb., which closed August 30, resolutions recommending medical inspection in all Adventists' schools were adopted.

New Rear Admirals.—Under the new naval bill two rear admirals will be appointed from the Medical Corps by the president. Under seniority these will be Medical Directors William R. DuBose and James D. Gatewood.

Workmen's Compensation Bill Becomes Law.—The bill providing compensation for employees of the federal government disabled in the line of duty, and providing medical, surgical, and hospital services and supplies for all such employees injured in the line of duty, whether disabled or not, has been signed by the president and is now a law. A synopsis of this bill appeared in THE JOURNAL, Sept. 2, 1916, p. 755.

Medical Intern Examination.—The United States Civil Service Commission announces an open competitive examination for medical intern for both men and women at various places in the United States, October 4. From the eligibles, certification will be made to fill vacancies in St. Elizabeth's Hospital, Washington, D. C., at $900 a year and maintenance. Persons who desire to take this examination should apply to the United States Civil Service Commission, Washington, D. C., for Form 1312, stating the title of the examination.

Appeal From Decision of Judge Advocate General.—Col. Henry P. Birmingham, acting surgeon-general of the army, has appealed from the approved opinion of General Crowder that the increase in the Army Medical Corps provided in the national defense act is effective by increments equally distributed over five years. Colonel Birmingham argues that this interpretation of the act will furnish a commissioned personnel for the Medical Corps of little above five per thousand instead of seven per thousand, as provided in the act.

Missouri Valley Physicians to Meet.—The annual meeting of the Medical Society of the Missouri Valley will be held in Omaha, September 21 and 22, under the presidency of Dr. John P. Lord, Omaha. Dr. Jabez N. Jackson, Kansas City, Mo., will deliver the address in surgery and Dr. Walter L. Bierring, president of the State Board of Health of Iowa, Des Moines, the address in medicine. Headquarters will be at the Hotel Fontenelle. Clinics will be held at various Omaha hospitals on the day following the close of the meeting for the benefit of visiting physicians.

American Chemists to Meet.—The forty-third annual meeting of the American Chemical Society will be held in New York, September 25 to 30, in conjunction with the Second National Exposition of Chemical Industries. Headquarters will be at the Chemists' Club, 52 East Forty-First Street, and the hotel headquarters at the Hotel Astor. Among the important papers to be presented at this meeting is one by Dr. Alice Hamilton, Chicago, chairman of the committee on industrial hygiene of the association, on "Dangers Other Than Accidents in the Manufacture of Explosives."

New Hospital Ship for Navy.—A ship built from the keel up for hospital purposes—the very first ship of its kind ever built anywhere—will soon be placed under construction by the navy department. Congress has appropriated $2,500,000 for the purpose, and the necessary specifications have been completed by the bureau of construction and repair, with the cooperation of the bureau of medicine and surgery. It will

accommodate 300 patients in time of peace, with an estimated capacity of 500 under war conditions. Every essential detail of a modern hospital is laid down in the plans. The ship is to measure 460 feet in length with a beam of 60 feet, and will be furnished with several stabilizers, to reduce the roll to a minimum.

Bequests and Donations.—The following bequests and donations have recently been announced:

Mt. Sinai Hospital, Montefiore Home for Chronic Invalids, St. Vincent's, Presbyterian, St. Luke's and Roosevelt hospitals, New York, each $5,000, by the will of Andrew Freedman.

Presbyterian Hospital, Philadelphia, will eventually receive one third of the estate of David M. Barrick valued at $70,000.

Jefferson Standard Life Insurance Company, Greensboro, N. C., a donation of $1,000 toward the erection of a tuberculosis hospital in Guilford County.

Missouri Association for the Blind, $50,000; Home for the Friendless, St. Louis, $25,000, and bequests to the St. Louis Children's Hospital and St. Louis Maternity Hospital, by the will of James J. Butler, St. Louis.

Georgia Infirmary, Savannah, Ga., $1,000, as a memorial to Mrs. Harriet L. Barnard, by the will of James M. Barnard.

National Board of Medical Examiners.—The National Board of Medical Examiners will hold its first examination in Washington, D. C., October 16 to 21. On the first day there will be registration of candidates and written examinations in anatomy, chemistry and physics. On the second day there will be written examinations in materia medica, pharmacology and therapeutics, oral and laboratory pharmacology, hygiene and its divisions and oral and laboratory hygiene. On the third day there will be taken up laboratory and oral chemistry and physics and written examinations in obstetrics and medical jurisprudence. The fourth day will be devoted to written examinations in medicine and surgery, and on the fifth day there will be written examinations in pathology and physiology, demonstrations of microscopic and gross pathology and laboratory demonstrations and on the last day, clinical examinations will be held at government hospitals on medicine and surgery. Further information may be obtained by inquiry of the secretary, Dr. John S. Rodman, 2106 Walnut Street, Philadelphia.

OUR TROOPS ON THE BORDER

Malaria Mosquitoes in Army Camp.—The anopheles has been discovered among the swarms of mosquitoes which recently appeared in the camp of the First Illinois Cavalry at Brownsville. One case of malaria is said to have occurred.

Paratyphoid Spreads.—The paratyphoid epidemic in Texas has spread to other New York troops. Two paratyphoid cases are reported in the Second Infantry and one of the two recent deaths in the Seventh Infantry is said to have been due to this cause. There are at present said to be fifty men ill with paratyphoid in the Fourteenth Infantry.

Refreshment Stations Established.—Col. Jefferson R. Kean, M. C., U. S. Army, director general of military relief of the American Red Cross, commends the establishment by Red Cross chapters of refreshment stations for troops en route, and calls attention to the order recently issued returning 21,000 troops to their home station. He requests that chapters on the routes of travel inform themselves of the time at which troop trains are expected to arrive and provide refreshment and entertainment for them, as was so successfully done when the troops went south two months ago.

Health of Troops.—Under this caption the *Army and Navy Journal* discusses editorially the health statistics of the troops of the regular establishment and of the National Guard on the Mexican border. It compares the figures of Surgeon-General Sternberg's report from May to September, 1898, with the figures of mortality and morbidity in the present campaign. In 1898 there was a strength of 167,168 men, while this year there were 139,222 men in the field, August 5. In the war with Spain there were 1,715 deaths, of which 640 were from typhoid fever. In the National Guard this year, with a strength of 98,500 men, there were two deaths and a sick rate of 1.14 per cent. for the week of August 5. During the same week, the regulars reported six deaths and a sickness percentage of 2.45 for the 40,722 men on the border and in Mexico. The report from the Southern department for the week ended August 19 shows a sick rate for the National Guard of 1.17 per cent., and three deaths, while the regulars had a sick rate of 2.02 per cent. with two deaths. This accords with the figures of 1898, which showed a death rate of 3.62 among the National Guard and of 5.83 among the regulars.——Dr. Thomas Darlington, formerly health commissioner of New York, after an inspection of the health conditions in the military camps along the border and in Mexico, reports that the sick rate is low, and states that adequate steps are being taken by the military authorities to safeguard the health of the guardsmen.——In a comment by General Pershing, August 22, on the health report, he cites the record of only one case of typhoid fever and of only six deaths among the regulars in a five-month campaign in Mexico as remarkable for an expedition serving in a country like Northern Mexico with nothing but field equipment.——There threatened at one time an epidemic of amebic dysentery in a camp in Mexico. When the sick rate reached 5 per cent., the chief surgeon and his entire corps were despatched to the camp from headquarters and after a quick and exhaustive study of camp conditions, measures were instituted which soon reduced the sick rate to 1.7 per cent. The chief means employed was the chloridation bag devised by Maj. William J. L. Lyster, M. C. There were at one time 125 cases of the disease in the camp, but this was soon reduced to thirteen.

Medical Work on the Border.—Col. Henry P. Birmingham, Acting Surgeon-General, U. S. Army, on account of circulars issued which have given the impression that the government was not taking adequate care of its troops on the border, has sent the following memorandum to the secretary of war:

The Medical Department has supplied every need and request from the Southern Department. In addition to the various small hospitals at minor posts along the border, we have established base hospitals at Fort Sam Houston and Fort Bliss, Texas. Base hospitals have also been authorized and are now being completed, supplied with personnel and equipment, at Brownsville, Eagle Pass, Laredo, Nogales and Fort Crockett. The hospital at Fort Crockett is not in process of organization. Should it be necessary to establish this hospital, it will occupy the building of the post. In addition, there are hospitals at Forts Huachuca, Clark, McIntosh, Columbus, Camp Douglas, Marfa, Del Rio and Deming. There are also seven field hospitals with the troops on the border, each with a capacity of 216 beds. This does not include the field hospitals of the Organized Militia now on the border. Field hospitals, while mobile hospitals, are always available to take care of the sick with troops until they can be evacuated to base hospitals. The government has expended large sums of money constructing new hospitals and increasing the bed capacity of the hospitals already built. The Southern Department has at its disposal, in addition to the money already expended on hospitals, $300,000 to be used at the discretion of the department commander. In addition, the department has organized and is now having completed a hospital train for the transportation of the sick and wounded from the border stations to the base hospitals mentioned above.

The army at this time has established general hospitals at the Presidio of San Francisco, with a maximum capacity of 953 beds; at the Army and Navy General Hospital, Hot Springs, Ark., 600 beds, and at Walter Reed General Hospital, Tacoma Park, D. C., 320 beds. The department has completed plans for the establishment of general hospitals at Fort McPherson, Ga.; Fort Sheridan, Ill.; Fort Douglas, Utah; Fort Oglethorpe, Ga., and Fort Benjamin Harrison, Ind., should conditions warrant. These hospitals will have a capacity of from 500 to 1,000 beds. Plans have been completed for disinfecting trains in case it is necessary to enter Mexico, for the purpose of disinfecting clothing of the soldiers in order that they may be protected against typhus fever. All soldiers on the border have been vaccinated against smallpox and typhoid fever. Medical supplies are on hand sufficient for the needs of the army now in the field or under orders for the border. Attention is invited to the fact that for approximately five years the greater part of the regular army in the United States has been on the Mexican border; the health conditions of the troops have at all times been excellent, and they have been and are now free from the usual camp diseases.

I believe the best interests of the government can be served by announcing through the press bureau that the government is not at this time in need of such committees as the American Committee for the Maintenance of the Border Hospital, Brownsville, Texas, and that appeals such as that filed by Mrs. Harriman convey a false impression and tend to create a feeling of insecurity and distrust in the minds of the people of the government's ability to care for its soldiers. Contributions such as requested in the letter of Mrs. Harriman are absolutely unnecessary and the activities of such organizations should, especially at this time, be discouraged by the government.

FOREIGN

Pass Medical Supplies for Palestine.—The allies have granted permission for the passage through the blockade of medical supplies shipped by New York Jewish societies on the U. S. S. cruiser *Des Moines* for the relief of sufferers in Jerusalem.

Physical Education in Spain.—Spain is organizing a national conference to promote physical training for young and old, athletics, sports and gymnasium work. The first Congreso Nacional de Education Fisica is to be held early next year at Madrid. It will be presided over by Professor Ocaña, who is one of the life term senators and professor of physiology at the University of Madrid.

Base Hospital Unit Financed.—To finance the complete equipment of an American Red Cross base hospital unit which is being organized by the American Red Cross with a staff from the German Hospital, New York, a contribution of $25,000 has been received from Mr. Fritz Achelis. The director of this unit will be Dr. Frederic Kammerer, who recently returned after active service with the German army.

Medical Equipment for Serbia Needed.—The Franco-Serbian Field Hospital Committee, of which Helen Hartley Jenkins is chairman, appeals for $30,000 for the complete equipment of a movable hospital of 100 beds which will be manned by an American personnel. The Serbian army lost its entire medical equipment in its retreat last fall. Subscriptions for this should be sent to Henry B. Britton, Treasurer, 17 W. Thirtieth Street, New York.

Heat Strokes in Mesopotamia.—The British Mesopotamian Expeditionary forces have had to contend with intense heat in their work at the head of the Persian gulf. At Basra the temperature has ranged from 104 to 109. The treatment of sunstroke and heat apoplexy practiced in Arabia is the intramuscular injection of 20 grains of quinin, as it is believed that the malarial parasite is a potent factor in the causation of heat apoplexy. The quinin injection kills the parasite and reduces the fever. Three or four pints of cool water, as near the freezing point as possible, are then given as an enema and the patient is packed in crushed ice.

Sterilizing the Water of the Tigris.—On account of the polluted condition of the water of the Tigris, the expeditionary forces in Arabia have been exposed to many varieties of water-borne diseases, especially typhoid fever, cholera and dysentery. The medical staff has employed an effective method of sterilization analogous to that recently used by Maj. William J. Lyster of the Medical Corps of the Army. Water is put into large canvas tanks in which alum is suspended, this causing the settling of the mud. Chlorine water is then added in the proportion of 2 fluidounces to 10 gallons of Tigris water and in an hour the water is said to be safely potable.

Letter from Berlin.—I. Zeehandelaar, an officer of the Public Health Service of the Netherlands, recently went to Berlin to make a study of functional neuroses and their treatment, especially with psychotherapy. The minister of war of the Netherlands called his attention particularly to this latter subject. His report appeared in the *Nederlandsch Tijdschrift voor Geneeskunde*, August 19. He says, "The reflex arc which elicited the desired permission for me to visit the military hospitals at Berlin ran like this":

[*Oorlog* in the language of the Netherlands means "war," *Gezant* means ambassador.] The way thus provided for him was so smooth that, he states, even his luggage was not examined at the frontier, and he regretted not having brought double his supply of cigars. At the Berlin hospitals he was warned that he must not speak to any soldiers on any subject connected with military matters. He says of his visit to the psychopathic ward of the Moabit penitentiary, "It was light and airy and looked out on some sunflowers although this institution is an old and lugubrious building. Sunflowers are profusely cultivated in Germany now for the oil from the seeds. There were many Poles and Russians among the psychopaths here. Some of the men had 'prison edema.' Without kidney or heart disease, they have edema in the legs when they stand, owing to the unfavorable conditions of their life. Some of the men complained of being hungry. They do not get enough to eat. The food in the prison is entirely different from what it was before the scarcity. The supply of bread and potatoes is so much less that they are really hungry. They get other articles, such as marmelade, beer, fruit, etc., which they never had had before, but this does not content the men. The lack of all fat is what makes the hunger sensation so strong. Leppmann, still chief of the psychopathic ward as before the war, does the best he can, but cannot do much. He combines the strict firmness with the kindliness which is indispensable in a position of this kind. One of the convicts had symptoms suggesting gastric ulcer, and he asked for consultation with a university specialist, which was in fact granted. The man can pay the consultant personally.

VOGT'S INSTITUTE

"O. Vogt and his neurobiologic institute are still housed in the old building where he has over a million specimens of brain tissue. He distinguishes 200 different fields in the cortex. Vogt told me that psychotherapy is not applicable to most of the soldiers who have been on active service, as their fear of being sent back to the front counteracts the effect of psychotherapy.

WAR PSYCHONEUROSES

"In this special field of the nonorganic nervous affections and psychoneuroses, which are so extraordinarily multiple in this war, Lewandowsky informed me that he regards them as exclusively psychic. Oppenheim's theory of 'molecular concussion' finds in him its greatest opponent. He does not apply treatment to this great mass of functional nervous affections. All that hysteria can produce in the way of deafness, dumbness, paralysis, tremor, contracture, etc., I saw in long series in his service. The men lie around without getting any special treatment. The stay in the hospital is made as little agreeable for them as possible. No or very few visits from the family and acquaintances are allowed. The motto is: 'Just wait and have patience and everything will go away of itself.' Sometimes this system succeeds, and sometimes not. When it fails and the man is declared unfit for further service, he is sent to his home as speedily as possible. He is reexamined a year later and may then be found fit for army duty. Lewandowsky has a high opinion of psychotherapy provided it is associated with occupation therapy and strict discipline in a suitable environment. But he does not think it can be applied in the ordinary hospital. Among the interesting cases was one of traumatic rigidity of the pupil after a blow in the face. Lewandowsky has seen other cases of this kind. An organic affection of the brain or spinal cord was out of the question in these cases. Leppmann also denounced the idea of attempting to apply psychotherapy in an ordinary military hospital, even in a special ward. By the time the men reach Berlin the hysteric phenomena are firmly established.

"To my question how epileptics get along in the war, Leppmann replied that epilepsy had not made itself noticeable during the war and, so far as he could judge, the seizures did not occur any more frequently. Sexual perversity did not seem to have increased. The psychoneuroses are not caused by the war, but their development is hastened in the predisposed and the manifestations of an inherited taint are more pronounced. Almost invariably it is possible to detect the predisposition in all such cases. Both Leppmann's and Lewandowsky's clinics are in the sixty-year old military hospital. A new building had been planned but the war interfered with its construction. The reason why it looks so extremely dingy is that there is no oil to paint it with.

OPPENHEIM'S SERVICE

"The clinic where Oppenhein displays his great talents and experience as a neurologist is installed in the magnificent structure, the home of the Museum of Arts and Crafts. The whole building is temporarily at his disposal and the clinics of his staff are also installed there, Kalischer, Flatau and others. Oppenheim's aid is frequently called on by the military authorities, and yet he finds time to study each patient and give a brief but clear insight into the case. Particularly interesting to me was the close cooperation of the neurologist and the surgeon. A whole group of cases were presented to the surgeon (Borchardt) and the two studied them together, even when it was not a question of an operation. The discussions were always right to the point. No one had time to waste on explanations. These cases were of wounds of peripheral nerves, plexuses, spine and skull. Neurolysis and other operations on the trunk nerves often improved function materially. One man shot through the cauda equina, completely paralyzed in the legs and bladder, was so improved by removal of splinters of bone that he now can run. The intimate cooperation of neurologist, surgeon, roentgenologist and serologist was truly remarkable. Not one but several roentgenographs are found in the reports of cases. The Wassermann reaction and lumbar puncture findings are recorded in a special register for each case, with an arrangement for ready reference. A medically trained secretary accompanies Oppenheim to every patient and records not only most fully all the objective findings but also the patient's complaints. There were numbers of neuroses in his service. Treatment was with electricity, psychotherapy and hypnosis. I noticed that the nervous patients were given a bottle of beer. Hysteric phenomena were frequently grafted

on organic affections. One man with a history of old syphilis presented symptoms of tabes. With closed eyes and feet together he fell, but not as with the true Romberg. He would have fallen like a block of wood if we had not caught him. Oppenheim said at once that this was hysteria, and held a bottle of valerian under the man's nose and asked him what it was. He started to open his eyes to look, but Oppenheim pressed on the eyelids and told him to smell without looking. His attention thus diverted, the man stood quietly for several seconds smelling at the bottle with his eyes closed and feet together.

"Lewandowsky avoids testing the sensibility of the skin with psychogenic neuroses, saying that the physician always suggests the findings here. No attempt at isolation was made at Oppenheim's clinic for the functional nervous affections. The treatment here does not seem rational or just. They are treated either with rigorous strictness or great mildness. It is difficult to know where the unconscious or intentional aggravation of the condition in these soldiers begins. The dread of being sent back to the front is also an important factor in the outcome. Treatment of hysteric deafness is peculiarly long and difficult to accomplish results, as no really good method of treatment seems to be known there. My method of treating it was received with great interest.

THE SCHÖNOW NEUROLOGIC SANATORIUM

"The Schönow institution, Laehr's realization of the ideal of a free sanatorium for neurologic cases, lies in fields and woods with ample equipment. Henneberg is in charge of the neurologic department, and the psychoneuroses are here also in large numbers. He does not expect much from psychotherapy for soldiers who have been at the front. The men have no wish to recover, and be sent back. He spoke with some bitterness of all these psychoneuroses, asking 'Did you ever see a hysteric with both arms paralyzed, or ever with the right arm paralyzed?' He has had two cases of psychogenic paralysis of the left arm. 'Have you ever seen one that let himself get soiled with feces?' He does not attempt to give them special treatment, and I became convinced from what I saw in Berlin that these victims of an inherited taint plus the emotions of the war do better when they are kept with the mildly wounded and are not isolated or segregated. At the earliest possible moment send them to their homes if at all suitable. Men with attacks of arrhythmia and tachycardia are given the needed repose in the Schönow sanatorium. It is equipped with everything for hydrotherapy and for training the men in various trades and in agriculture. I was present at the inoculation of a number of men against typhoid and cholera, which is repeated every six months. The heart neuroses are differentiated from organic trouble by E. Weber's method. The volume of the arm is registered with a plethysmograph before and while the foot is swung vigorously to and fro for fifteen seconds. Weber says that the curve then shows at a glance whether the heart is sound or not.

BERLIN'S FOOD SUPPLY

"In order to determine for myself whether the populace of Berlin is undernourished, I went to a free bathing place where men, women and children lie around on the sand in bathing suits. I was there for several hours on two days, and thus I saw many dozens of Berlin's people very nearly naked, and I was soon convinced that there can be no question of undernourishment there. I wish that my Amsterdam city patients only looked as well nourished. The food supply is poorest at Berlin on account of the crowded populace and the difficulty of equitable distribution. The Berliners have to do without much, but there is no real hunger. I took meals at all kinds of places, good and cheap restaurants. The food costs more than it used to, but there is enough and the poor are looked after especially. The most critical months are past as the fine harvest is at hand. The people eat less than they used to, but they have adapted themselves to this. They drink their coffee without sugar, eat their potatoes without gravy, spread their bread very thin with butter or use jam instead, eat no meat on certain days in the week, and they have lost their protuberant abdomens, but they are very far from starving.

USE OF HIGH FREQUENCY APPARATUS

"I also visited the 'High Frequency Promenade Hall.' It is fitted up with high frequency apparatus so that the hall forms a high frequency alternating field like that on a small scale in the solenoid. The electricity is so strong that touching with the finger elicits a powerful spark. The institution is fathered by an engineer and backed by considerable capital. It is designed for treatment of deranged metabolism of all kinds accompanied by high blood pressure and nervous troubles. I myself know too little about the high frequency current to ever advise a patient of mine to go into an atmosphere so heavily laden with electric currents. It is proposed to erect such institutions in different cities, after the model of the one in Berlin, the first in the world."

MEDICAL PRISONERS OF WAR

In conclusion Zechandelaar relates that he tried to investigate the truth of the rumor that Germany is detaining so many medical men and members of the nursing force belonging to the entente allies. He applied to the state department of foreign affairs and was given a permit to visit a prisoners' camp and talk with the medical men there, but did not have time to do so. He says of this, "At the state department I was told that it was a reprisals measure. The French and the Russians began this detaining of the medical men. Then Germany did the same. At the same time the official admitted that this holding prisoners the physicians and nursing force conflicts with the Geneva convention. I was told, moreover, that within a few weeks, an agreement is to be made with Russia and France whereby all directly connected with the medical service will be released except for a small percentage who are absolutely required for medical care of their own countrymen. Naturally only Russian physicians can be used for the different camps of Russian prisoners. This percentage to be detained is to be small and the same for each nation. Hence the larger proportion of our confrères now in prison camps are facing better times."

PARIS LETTER

PARIS, Aug. 17, 1916.

The War

A NEW SCHOOL FOR THE REEDUCATION OF CRIPPLES

Mr. Godart, undersecretary of state for the sanitary service of the army, has recently inaugurated at the Maison Blanche of Neuilly-sur-Marne, a new institution for physical reeducation. This has been organized by the union of foreign colonies in France for the benefit of victims of the war (THE JOURNAL, July 22, 1916, p. 297). The Maison Blanche is more particularly intended for those who have lost arms or legs. The creation of this school has been rendered possible by the liberality of Mr. Edward Stotesbury of Philadelphia, who in response to the appeal of Mme. Baylies of the New York committee, immediately placed at the disposition of the work about half a million francs ($96,500), while the New York American committee was, on its part, able to collect more than 1,000,000 francs ($193,000). The government furnishes the first artificial limbs for the cripples, but the upkeep of the institution is at the expense of the union of foreign colonies, which has made of it a model institution endowed with all modern conveniences and comforts, the most perfect equipment, and the most ingenious apparatus permitting the cripples to exercise various trades, even to cultivating their artistic talents. This school of physical reeducation is divided into two sections. In the one, French, English, accountancy, stenography, etc., are taught. The other is devoted to manual work and has workshops for fitting of joinery, cabinet making, shoemaking, tailoring, harness making, saddle making, basket work and tinsmith's work. The founders of this institution attach especial importance to its moral influence as much as to the physical reeducation of the cripples. The majority of these men return from the war depressed, discouraged by the loss of their limbs, anxious about the future, and with the feeling that the pension which they will receive will not suffice. It is, therefore, necessary to console them, to reassure them and to bring back their taste for life, their love of work, and their confidence in themselves and in the future.

THE FRENCH HOSPITAL IN ITALY

A year ago, I mentioned the establishment at Milan of the French hospital. The French colony in Rome has followed this example by installing a hospital for the Italian wounded. These, however, are not the only works of benevolence created by the French in Italy. Many French families living in this country have offered their services to the works of assistance or benevolence in favor of victims of the war. Thus at the entrance of a small village of Seravezza, situated in Spezia on the shoulder of Mount Carrara, the French flag floats over a large establishment. This is a hospital of fifty beds equipped with all modern conveniences,

which was established and has been maintained completely by the Henraux family, a French family installed for many generations in this region of marble quarries.

A SCHOOL OF CLOCK MAKING FOR CRIPPLES

Mr. Justin Godart, undersecretary of state for the military, sanitary service of the army presided at the inauguration of a school of clock making at Cluses (department of Haute-Savoie) where forty-five men who have lost their legs will be taught the trade of clock making.

A LIBRARY FOR THE BLIND

It is estimated that there are about 35,000 blind persons in France, of whom a considerable number owe their affliction to war wounds. For these unfortunates, reading is one of the few consolations left. Unfortunately, there are very few works in Braille type. We have two libraries in Paris and one in Lyons containing altogether 40,000 volumes. This does not amount to very much, because the ordinary book of 300 pages, when printed in Braille type, occupies four or five volumes. It has been decided to complete this library. At present, the preparation of a dictionary for the blind has been undertaken. This will be extremely succinct, each word being followed by only one word of explanation. This work of condensation is being carried out under the direction of the celebrated writer Anatole France, by a young man of letters, Guy-Robert de Costal. When the text is prepared, the work will be set up and printed on the Ernest Vaughan press. This is a very ingenious invention (The Journal, Sept. 17, 1910, p. 1036). It is intended for the composing and printing of Braille type, and it is so constructed that persons who are not typographers by profession can use it. In this way, those who have time at their disposal may employ it by composing and printing Braille type plates and thus contributing to the formation of the library for the blind.

DEATH OF PROFESSOR A. CHARPENTIER

Dr. A. Charpentier, professor of medical physics at the Faculté de médecine de Nancy, has died suddenly in his sixty-fifth year. Since 1888, he was a correspondent member of the Académie de médecine.

DIAGNOSIS OF PULMONARY TUBERCULOSIS IN SOLDIERS

At one of the last sessions of the Société médicale des hôpitaux de Paris, Dr. Emile Sergent, hospital physician, presented a communication on the differential diagnosis of pulmonary tuberculosis in which he insisted on the fact that this diagnosis should be made only when an examination completely demonstrates the existence of the disease, and permits of eliminating the commonest causes of error. Among the latter considerable place must be given to lesions and obstructions of the upper air passages and in particular of the nose and of the nasopharynx. It is certain that among the subjects suspected of consumption many are not tuberculous. Sergent is convinced that fewer men would have been discharged as tuberculous if the order for discharge had not been made until the patient had passed some time under observation. Dr. LeGenre, hospital physician, who is especially charged with the sorting out of tuberculous soldiers, brought forward observations which concorded perfectly with those of Sergent. There can be no doubt that, on the discharge sheets of soldiers, the word "hemoptysis" is somewhat abusively employed. For the diagnosis of tuberculosis one should not content one's self with a single symptom, such as hemoptysis, but should depend on a careful confrontation of the results furnished by the numerous diagnostic procedures at our disposal.

The Société médicale des hôpitaux passed a resolution recommending that all soldiers suspected of tuberculosis or subject to cough should be examined and reported on by specialists, for which purpose they should be detained in special hospitals for the necessary time.

THE ANATOMIC EXCURSIONS OF A BULLET

At the Réunion médico-chirurgicale de la 1-ère armée, Dr. Grandgérard communicated an interesting case of a shrapnel bullet which had entered through the left supraclavicular fossa and, by roentgenoscopy, was found in the right auricle. One hour after the examination, the patient having got up, the ball was found again in the triangle of Scarpa in the track of the femoral vessel, and then, after a few minutes of lying on his back, opposite the right sacroiliac symphysis at the level of the iliac vessels. At operation the projectile was found in the internal iliac vein, where the operator fixed it by a proximal ligature.

LONDON LETTER

London, Aug. 28, 1916.

The War

THE TRAINING OF THE DISABLED FIGHTERS

The problem of the soldier disabled from fighting by some mutilation or disease but capable of being trained for some civil occupation is engaging the consideration of the authorities. It is realized that it is not sufficient to simply discharge the man from the army with a pension and an artificial substitute for any part which may have been lost. Establishments for the training of such men in some civil occupation have been formed. Of these the most important is the so-called "Command Depot" at Tipperary, Ireland, established under the direction of Prof. Sims Woodhead of Cambridge. Massage, electric treatment and drill of various kinds are given. There are handicraft schools in which the men are trained in crafts suitable to their abilities. Damaged men are trained in motor driving and in ordinary road repair work. The theory of the motor engine is being taught in order that they may be able to apply knowledge of it to farm work in which motor engines are coming into use. Other branches of industry, French polishing, electric fitting, and typewriting are also being taught. As a result of experience gained here the local executive committee has decided to equip and maintain a special institute in which discharged soldiers may attend classes organized for the men in the depot.

THE PRICES OF FOOD DURING THE WAR

For the first time during the war a decrease, though only slight, in the general level of the prices of food is announced. This occurred in July and was mainly owing to the decline in the price of potatoes though there was also a general reduction in the price of cheese. Imported meat was a little cheaper on August 1 than a month earlier. The average percentage increase on retail prices in July, 1914, at the beginning of each month since the beginning of the war is as follows:

	Per Cent.		Per Cent.
September, 1914	10	October, 1915	35
January, 1915	12	January, 1916	45
April, 1915	24	April, 1916	49
July, 1915	32½	July, 1916	61
		August, 1916	60

These figures relate to food only. It may be estimated that the average increase in the cost of living of the working classes, taking food, rent, clothing, fuel, and light and miscellaneous expediture into consideration, between July, 1914, and the present time, is between 40 and 45 per cent., disregarding increased taxation and assuming that the standard of living has not been modified in view of war conditions.

THE EFFECT OF WAR ON INSANITY

The annual report of Dr. William Graham, resident medical superintendent of Belfast District Asylum, and one of the best known alienists in Ireland contains some remarkable conclusions as to the effect of war on insanity and mental disorder. The number of admissions to the asylum during the past year shows a marked diminution as compared with the average for the past ten years, and the interesting, and at first sight paradoxic, fact is that this diminution takes place at a time when we are involved in the greatest war in the history of the world. It has become a commonplace since August, 1914, to say that the world is growing mad, and there is a widespread, popular notion that the distress and agony of a conflict so terrible as the present one must end in profound psychic disturbance and alienation. Yet the fact is indisputable that insanity, like crime has lessened during the period of the war. It will not do to say that the vast number of men called to the colors include some who might otherwise be reckoned among our asylum population, for the greatest reduction is among women, 119 being admitted in 1915 against 154 in 1913. The future is equally encouraging. The problem of the probable influence of the war on the mental life of the nation and on insanity is not an isolated one. It is implicated in the general economic, sciologic, and physical state of the community at a given time. There are grounds for hope that especially, though not exclusively, among women we shall find a great diminution in those neurotic disorders that form part of mental abnormality. Thousands of men who have gone or are preparing to go to the front have all their life been subject to the bondage of neurasthenic weakness and incapacity or of psychasthenic fears or hypochrondriac fancies. They have never known what it is to live. The physical regimen under which these men are

compelled to live can have nothing but the best effect on those subjected to its discipline. Especially significant is the change coming over the lives of the women of the middle classes. These sheltered daughters of the merchant or of the professional man are now falling into line with their sisters of the upper and humbler social ranks. Idleness and ennui have lost their hold; healthy and unselfish activity is now the prevailing fashion. The war has enfranchised women. Among the mighty sociologic forces which the present world conflict has set in motion not the least will be the new value set on all sorts of good work and the new dignity which will crown the workers. With the ever-widening circle of women's interests a new barrier against mental disorder has been erected. War is the destruction of culture, art, education—the finest fruits of humanity. But the human mind has the strange power of wringing out of the worst evils some great and far-reaching good.

THE DEMAND FOR PHYSICIANS FOR THE WAR

The Local Government Board has addressed a circular to county and metropolitan borough councils, sanitary authorities, joint hospital boards, and committees and joint committees for appointing health officers, stating that it has become necessary to make provisional arrangements for enabling every physician of suitable age (45 and under) who can be spared from civil employment without serious injury to the civil population to place himself at the disposal of the authorities and to be prepared, if required, to take a commission in the army or navy in the near future. Authorities are accordingly requested to make a return of physicians of military age (1) who could be spared almost at once; (2) who might be spared later, and (3) who cannot be spared.

WHOLE CEREALS AS FOOD

Advocating the use of whole cereals as food in war time, Sir James Crichton-Browne, at a conference held by the Bread and Food Reform League, said that to some extent he was there as "a patriotic Scotsman" in defence of oatmeal. He believes it is the most nutritious of the cereals and certainly the most economical. Probably the people are better fed now in war time than in any previous period; but it is evident that cheaper foods will be required to take the place of beef, eggs and milk. Whole cereals will supply the necessary requirements but it is essential that they shall not be robbed of their principal constituents. Good digestion does not rest on appetite, but on mastication, and the prevalence of dental decay might be traced to the use of soft foods. He suggests that in munition canteens whole cereal foods ought to be provided, and he understands that the subject is now under consideration by the government.

Dr. Saleeby moved a resolution urging government attention to the importance of utilizing during war time whole cereals, especially whole wheat meal, whole wheat flour, oatmeal, unpearled barley, and unpolished rice. The greatest waste in the country, he said, is in regard to our use of wheat and coal, and it is true economy to attempt to get full value out of both.

Marriages

WILLIAM W. PERDUE, M.D., Mobile, Ala., to Miss Eleanor C. Bartlett of Chicago, in New York City, September 5.

JUDSON M. MEYERS, M.D., Superior, Wis., to Miss Jeanette Carlson of Spooner, Wis., in Duluth, Minn., August 26.

ERNEST MORRISON EWERS, M.D., Louisville, Ky., to Miss Ruth A. Schoefer of Pierceton, Ind., August 29.

IVAN CHARLES JACKSON, M.D., Portland, Ore., to Miss Lola Heskett of Enterprise, Ore., June 14, 1915.

HUGO FRIEDSTEIN, M.D., Kansas City, Mo., to Miss Helen Seelenfreund of Chicago, September 11.

ALLEN HAMILTON BUNCE, M.D., Atlanta, Ga., to Miss Lena River of Worcester, Mass., August 28.

LEWIS HASBROOK KEMBLE, M.D., Glendale, Colo., to Miss Virginia Lowe of Denver, August 28.

MARTIN HENRY MERBITZ, M.D., Chicago, to Miss Norma Helen Irasek of Milwaukee, May 17.

BENJAMIN NEWHOUSE, M.D., to Miss Esther Raum, both of Washington, D.C., September 10.

WALTER IVAN LILLIE, M.D., Flint, Mich., to Miss Opal Jones of St. Johns, Mich., August 30.

GROVE HARKNESS, M.D., to Miss Florence Trumpf, both of Waukesha, Wis., August 15.

Deaths

Surg. Rudolph H. von Ezdorf, U. S. P. H. S., aged 43; in charge of the marine hospital at New Orleans, who was recently ordered to special duty at Lincolnton, N. C., died in that place, September 8, it is believed from heart disease.

Dr. von Ezdorf was a native of Pennsylvania, was graduated from the Columbian University, Washington, D. C. (now the George Washington University), in 1894. He entered the Public Health Service as assistant surgeon, March 2, 1898; was made passed assistant surgeon, Feb. 28, 1903, and was promoted to surgeon, Oct. 1, 1912. During the United States intervention in Cuba, Dr. von Ezdorf served as quarantine officer in Santiago and later was quarantine officer of the Isthmian Canal Commission at Cristobal and Colon. He was also on duty with the United States forces when they occupied Vera Cruz, Mexico, in 1914. From 1907 to 1910 he was in charge of the Quarantine Station at New Orleans, and in 1911, during the threatened invasion of the United States by cholera, he was quarantine officer of the port of New York. Dr. von Ezdorf was a Fellow of the American Medical Association and a member of the Association of Military Surgeons of the United States. By reason of his long residence in summer climates and his special study and research regarding yellow fever and malaria he was esteemed an expert in these diseases, and his death is a distinct loss to the Public Health Service and to sanitary science.

George Jameson Cook, M.D., Indianapolis; Kentucky School of Medicine, Louisville, 1866; aged 72; a Fellow of the American Medical Association; professor of gastro-intestinal surgery in Indiana University School of Medicine, Indianapolis, for more than thirty years; once president of the Indiana State Medical Association and Indianapolis Medical Society; for twenty years business manager of the Indiana Medical Journal; a pioneer specialist in the field of gastro-intestinal surgery and a physician greatly esteemed and much beloved; died at his home, August 31, from heart disease.

John Wesley Ward, M.D., Pennington, N. J.; University of Pennsylvania, Philadelphia, 1866; aged 76; formerly a Fellow of the American Medical Association; an honorary member and president in 1890 of the Medical Society of New Jersey; a member of the staff since 1866 and superintendent for more than thirty years of the New Jersey State Hospital, Trenton; died at his home, August 24.

William Hall Brace Pratt, M.D., Brooklyn; College of Physicians and Surgeons in the City of New York, 1867; aged 73; a Fellow of the American Medical Association; consulting physician and a member of the board of managers of the Methodist-Episcopal Hospital, Brooklyn; for forty-five years a practitioner of that city; died at his home, August 27, from arteriosclerosis.

John A. Fritchey, M.D., Harrisburg, Pa.; University of Pennsylvania, Philadelphia, 1879; aged 58; three times mayor of Harrisburg; for many years surgeon for the Pennsylvania System and Northern Central Railroad, and assistant surgeon of the Governor's Troop, N. G., Pa.; died in the Presbyterian Hospital, Philadelphia, from disease of the liver, August 25.

Ozias Willard Peck, M.D., Oneonta, N. Y.; Yale University, New Haven, Conn., 1857; aged 81; a member of the Medical Society of the State of New York; surgeon in the army during the Civil War; for twenty-six years health officer of Oneonta and consulting physician to the Aurelia Osborne Fox Memorial Hospital; died at his home, August 4.

Edward Meggenhofen, M.D., Chillicothe, Ohio; Kentucky School of Medicine, Louisville, 1893; aged 59; a Fellow of the American Medical Association and for many years a practitioner and druggist of Chillicothe; was instantly killed, August 23, when his automobile slipped from the towpath road into the bed of an empty canal near Chillicothe.

William Thackery Cathell, M.D., Baltimore; College of Physicians and Surgeons, Baltimore, 1886; aged 52; a member of the Medical and Chirurgical Faculty of Maryland and a specialist on diseases of the nose and throat; demonstrator of anatomy in Baltimore Medical College; died in the Hotel Emerson, Baltimore, August 24, from nephritis.

Warren Fisher Gay, M.D., Boston; Harvard Medical School, 1893; aged 50; a Fellow of the American Medical Association; a well known surgeon of Boston and at various times on the staff of the Boston Dispensary, Carney, St. Elizabeth's, Massachusetts General, and Massachusetts Women's hospitals, died at his home, August 26.

James Henry McLaughlin, M.D., Sutter Creek, Calif.; Kentucky School of Medicine, Louisville, 1891; aged 54; a member of the Medical Society of the State of California; who had been ill for many years with diabetes, died in the Dameron Hospital, Stockton, Calif., August 20, from cerebral embolism.

William Rutledge Hudson, M.D., Huntington, W. Va.; Johns Hopkins University, Baltimore, 1911; aged 32; a Fellow of the American Medical Association; while endeavoring to save his brother-in-law and brother from drowning in the Shenandoah River at Luray, Va., July 23, was accidentally drowned.

Earl Curtiss Peck, M.D., Philadelphia; Jefferson Medical College, 1914; aged 25; first assistant resident physician in the Philadelphia Municipal Hospital, Germantown; formerly of Newton, Mass.; died in the Municipal Hospital, September 5, from anterior poliomyelitis.

Howard S. Justice, M.D., Hutchinson, Kan.; College of Physicians and Surgeons, Keokuk, Iowa, 1865; aged 79; formerly a Fellow of the American Medical Association; for more than fifty years a practitioner of Missouri and Kansas; died at his home, August 25.

William George Brede, M.D., Minneapolis; University of Minnesota, Minneapolis, 1906; aged 40; formerly a Fellow of the American Medical Association; a member of the Minnesota State Medical Association; died at his home, September 5, from septic pneumonia.

Robert G. Witherspoon, Anderson, S. C. (license, South Carolina, years of practice); aged 70; formerly a member of the South Carolina Medical Association; a practitioner since 1875; died at his home, June 9, from chronic bronchitis.

Thomas T. Matlock, M.D., Dalark, Ark.; Beaumont Hospital Medical College, St. Louis, 1900; aged 41; is said to have shot and fatally wounded his wife and then to have committed suicide, August 21.

Marcus Francis Brown, M.D., Billings, Mont.; College of Physicians and Surgeons, Chicago, 1908; aged 35; a member of the Medical Association of Montana; died at his home, August 28, from neuritis.

S. P. Watson, M.D., Loris, S. C.; College of Physicians and Surgeons, Baltimore, 1884; aged 54; formerly a member of the South Carolina Medical Association; died at his home, August 14.

Tyner Emanuel Lowe, M.D., Greenfield, Ind.; Homeopathic Medical College of Missouri, St. Louis, 1908; aged 39; died at the home of his parents in Indianapolis, August 26, from carcinoma.

James S. Knott, Dallas, Texas (license, Texas, Eleventh Judicial District Board, 1879); aged 72; a practitioner for nearly half a century; died at his home, May 31, from uremia.

Josias Edgar Jones, M.D., Digby, N. S.; Harvard Medical School, 1858; aged 78; died suddenly from heart disease, while on a fishing trip in Nova Scotia, May 18.

Martin Giesy, M.D., Aurora, Ore.; Willamette University, Salem, Ore., 1868; aged 83; a pioneer practitioner and druggist of the state; died at his home, August 22.

Rudolph Goldstein, M.D., Tampa, Fla.; University of Louisville, Ky., 1894; aged 59; is reported to have committed suicide in his room in Tampa, May 2.

William McKelvey, M.D., Denver; University of Pennsylvania, Philadelphia, 1875; aged 64; died at his home, July 13, from perforating gastric ulcer.

M. J. Newberry, M.D., Lizella, Ga.; Atlanta (Ga.) Medical College, 1886; aged 54; died at his home, August 27, from cerebral hemorrhage.

La Fayette Cate, M.D., Adin, Calif.; Vermont Medical College, Woodstock, 1852; aged 86; died at his home, August 25, from heart disease.

Winfield S. Makemson, M.D., Rio Vista, Calif.; Medical College of Ohio, Cincinnati, 1884; died in Rio Vista, August 24.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SULFURYL MONAL

Report of the Council on Pharmacy and Chemistry

Sulfuryl Monal is said to be manufactured by Monal Freres, manufacturing chemists of Nancy, France. It is sold in the United States by George J. Wallau, Inc., New York City. According to the label:

"Each Pastille { Contains: Sulfuryl (combined polysulphurets) = 0.35 centigr." / Liberates: Nascent sulphuretted Hydrogen = 2 cub. cent."

The Chemical Laboratory of the American Medical Association was requested to check the amount of available hydrogen sulphid. An original bottle of Sulfuryl Monal was used; this contained tablets having the taste of licorice extract and an odor of hydrogen sulphid. The tablets were found to liberate about 6 c.c. hydrogen sulphid to each tablet.

Among the claims made for the preparation are:

"Dissolved by the saliva, Sulfuryl Monal reaches the stomach where, under the influence of the gastric juice, it generates nascent sulphuretted hydrogen. Professor Albert Robin's remarkable researches have proven that it is in the nascent state that drugs produce the greatest effect with the smallest dose. . . . Being thus eliminated by the entire respiratory tract: the lungs, bronchi and the throat, the sulphuretted hydrogen passes from the interior to the exterior, that is to say, goes right through these organs which are, as a consequence, thoroughly cleansed, antisepticized and freed of the pathogenic microorganisms. . . . Then again, part of the sulphuretted hydrogen, liberated in the stomach, is eliminated by the mouth and acts as an antiseptic and disinfectant of the mucous membranes of the throat and mouth. Hence Sulfuryl Monal is a perfect protective agent against contagious diseases. . . . Numerous clinical tests have demonstrated its real efficacy in diseases of the throat and of the respiratory tract: laryngitis, pharyngitis, hoarseness, granulations, tonsillitis, colds, bronchitis, pulmonary catarrh, asthma, emphysema, grippe, whooping cough, simple and infectious pneumonia, and in the first stage of pulmonary tuberculosis."

The sulphids are practically ignored in modern textbooks. There is a rather extensive clinical literature on the subject, particularly in connection with sulphur waters; this, however, offers no good evidence for the therapeutic value of sulphids. Probably the tradition in their favor is largely due to the old popular idea that a disagreeable taste or odor is a mark of a good remedy.[1]

When hydrogen sulphid is introduced into the body, the small amounts that appear in the expired air are insufficient for quantitative demonstration and it is highly improbable that the amount thus excreted has any germicidal action, or that enough is excreted in the lungs to cause irritation and a reaction. The claim that Sulfuryl Monal is "a perfect protective agent against contagious diseases" is unwarranted; the recommendation for its use in "simple and infectious pneumonia, and in the first stage of pulmonary tuberculosis" is dangerous and vicious. The Council declared Sulfuryl Monal ineligible for New and Nonofficial Remedies and authorized publication of this report.

[EDITORIAL NOTE.—With one exception, this product does not appear to be advertised in medical journals. We find, however, in the gallery of nostrums that grace the advertising pages of the *International Journal of Surgery*, that Sulfuryl Monal has its place. According to an advertisement that has been running some months in this publication, "affections of the throat and respiratory organs respond promptly" to Sulfuryl Monal whose "effects are rapid and certain" even in "incipient tuberculosis." This preposterous pronouncement is no worse than many others appearing in the same journal, but it is bad enough to indicate how uncritical must be the physicians who support—by subscription or contribution—publications that are still debasing scientific medicine.]

1. Liquid Sulphur — Sulphume, THE JOURNAL A. M. A., Dec. 2, 1911, p. 1853.

BI-TARIDE TABLETS

Report of the Council on Pharmacy and Chemistry

Bi-Taride Tablets, dark-brown tablets with a strong tarry odor, were submitted to the Council by the Germicidal Products Corporation, New York. According to information furnished:

"The tablet is a mixture and contains as active principle (25%) of the aromatic series of coal tar with the group formula $C_nH_{2n-a}(OH)$, Cane Sugar, Sugar of Milk, Boric Acid, etc., sufficient to ensure a soluble and stable tablet."

The identity of the "active principle (25 per cent.) of the aromatic series of coal tar with the group formula $C_nH_{2n-a}(OH)$" is not declared, neither is the amount of boric acid stated, while the "*et cetera*" suggests the presence of other medicinal constituents, which are not named. In the letter of submission the phenol coefficient was given as 1.4 and the toxicity as 4 per cent. Enclosed with this letter, however, was a report which showed the toxicity to be 15 per cent. as compared with phenol.

The bottle containing the tablets has the name "Bi-Taride" blown in the glass while the carton containing the bottle bears the following recommendations:

"For fresh wounds, cuts, burns, bruises, boils, carbuncles, ulcers, erysipelas, gangrene, diseases of the scalp, vermin and in cases of infection and suppuration; destroys all germs of contageous and infectious diseases."

"Vaginal Douche, Useful in Leucorrhoea and other female disorders, allays inflammation, prevents contagion . . ."

Reliance on a germicidal preparation in such affections as erysipelas, gangrene and leukorrhea is likely to lead to harm, and advice to this end is pernicious. The Council voted that Bi-Taride Tablets be held ineligible for New and Nonofficial Remedies in that the composition [of the tablets] is essentially secret (Rule 1); in that the recommendations for their use constitute therapeutic exaggeration and an invitation to the public to depend on them in contagious and other serious diseases (Rules 6 and 4) and in that the combination of coal-tar derivatives with "Boric Acid, etc.," is irrational. After submission of this report to the Germicidal Products Corporation the Council authorized its publication.

GLYCO-THYMOLINE AND POLIOMYELITIS

One characteristic of the "patent medicine" business is that it trades on fear. Should an epidemic occur the market is flooded with new nostrums purporting to cure or prevent the disease in question, while the manufacturers of older "patent medicines" revamp their advertising so as to make it appear that their preparations are all that stand between the scourge and the public. One has but to remember "Peruna's" exploitation of the yellow fever epidemic in New Orleans some years ago and the way in which the exploiters of "Pond's Extract" played on the fears of the public at the time of the former meningitis epidemic in New York City.

At present the public is much exercised over the epidemic of infantile paralysis. Anticipating that the nostrum fraternity would attempt to reap a golden harvest from the public distress, the federal officials issued a bulletin of warning on the subject. Naturally, the bulletin was addressed to the lay public, the government assuming that physicians knew enough to avoid being misled by any such advertising campaigns. Apparently, the assumption is too broad. At any rate, the manufacturers of "Glyco-Thymoline" are circularizing physicians, one of whom writes as follows:

To the Editor:—I am enclosing circular letter that I received this morning which seems to me almost a crime. I do not suppose that there is any way to prevent anything of this sort, but it is certainly a shame to attempt to deceive people in this way. As I recollect, Glyco-Thymoline is almost inert, practically no more efficient than Dobell's solution.

E. FLETCHER INGALS, M.D., Chicago.

The circular letter referred to was on the stationery of Kress & Owen Company, manufacturers of Glyco-Thymoline. It read:

Dear Doctor:—Regarding Infantile Paralysis, it is conceded that the source of infection is through the Nose, Mouth and Throat.

Taking this to be correct, we believe that there is no safer prophylactic measure than the use of Glyco-Thymoline, with three parts of water, as a mouth, tooth and nasal wash, by means of the K. & O. Nasal Douche and the toothbrush.

Glyco-Thymoline tends to promote exosmosis, and prevents the absorption of the germ or toxic matter.

We would be very glad to send you samples of both Glyco-Thymoline and the Douche should you so desire.

With best wishes, we beg to remain,

Yours very truly,

KRESS & OWEN COMPANY.

Glyco-Thymoline has been discussed in these pages. A report[1] of the Council on Pharmacy and Chemistry pointed out that this "patent medicine" is simply a weak antiseptic, so feeble that even in full strength it does not kill *Staphylococcus aureus* in four hours and is of little, if any, greater therapeutic value than sterile salt solution. Yet, Glyco-Thymoline has been recommended by its manufacturers, either directly or inferentially, for such diseases as diphtheria, ophthalmia neonatorum, consumption, etc. Today its manufacturers put it forward as one of the safest prophylactic measures against infantile paralysis and have the effrontery to make this suggestion, not to the uninstructed public but to the medical profession. Presumably, as a business organization, the concern believes it will convince a sufficient number of physicians of the therapeutic efficacy of its product to pay for the cost of this advertising campaign. If it appraises the situation correctly there need no longer be any wonder expressed that in the recent suit against THE JOURNAL, "patent medicine" makers were able to enlist the help of medical men.

Correspondence

The Deaf Child's Dependence on the Physician

To the Editor:—Helen Keller gratefully acknowledges in her autobiography her indebtedness to a physician for telling her mother that she ought to write to the Perkins' Institution for the Blind for advice about the education of her little daughter stricken with blindness and deafness.

It is not always that physicians receive credit for the useful advice they give outside their professional realm. But, on the other hand, many physicians fail to render this service. Scarcely a month passes that I do not see deaf persons whose condition with regard to speech and education would have been much more favorable if the physician to whom they were taken in childhood had given their parents the address of some competent authority on the teaching of the deaf by the speech method, to whom they could have applied, either by letter or in person, for advice and guidance.

Deaf children are almost wholly dependent on physicians for the information that leads to a beginning of their training in speech and lip reading sufficiently early to insure the best results in each case. The years between birth and the age of 5 are of the greatest educational importance to a deaf child, and it is only through the physician that knowledge of where to get the necessary guidance can reach the parents early enough to be of the utmost benefit.

The word of the physician has great weight for good or ill, and it should be spoken advisedly. The parents of a deaf child and the physician desire first of all the restoration of hearing. If this cannot be attained, they desire to enable the child to speak and to understand when spoken to, and to live a normal life among hearing and speaking people. The tendency of deafness is to segregate its victims, and this tendency is unfortunately increased by certain methods employed by many teachers in the education of the deaf. It is to the employment of finger spelling and sign language during the impressionable educational period that the creation of the typical "deaf-mute" is principally due. If the child is carefully trained from its earliest infancy to associate ideas with the visible movements of speech, and his thought habits are formed along normal lines of intercourse by the universal method of communication, he will not find himself an alien using a foreign language when he leaves the school and takes up his life work.

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1. THE JOURNAL A. M. A., Oct. 10, 1914, reprinted in the ninth (latest) edition of "The Propaganda for Reform."

The physician who, by his advice, or by his failure to advise, allows the deaf child to enter the abnormal environment of the silent method of teaching, is helping to deprive that child of a fair chance to surmount his misfortune to the utmost possible degree. When he directs the child's parents to some person who believes in, or at least uses silent methods of communication in his dealings with his pupils, the physician is heading that child toward deaf-mutism and isolation.

Probably the person to whom the physician sent the parents for guidance says that his is a "combined school" in which they employ all methods of reaching the imprisoned mind of the child: that they teach by speech and lip reading as well as by finger spelling and the sign language. As a matter of fact, many years of experience have shown that it is not possible to develop adequately the inherent possibilities of practical speech and speech reading when silent methods of communication are employed with the pupils during their school life. The child goes into such a school a possible member of a speaking community, and comes out a deaf-mute, whose only means of communication with those around him is either by finger spelling, the sign language or pencil and paper. It is even true, sometimes, that the child whose deafness has occurred after speech has been acquired, and who enters those portals a speaking person, comes out dumb.

Bearing these facts in mind, the physician should place his patient in communication with some educator who does not use the primitive methods of silent communication. If such a person is not available close at hand, for a personal interview, an address should be given to which a letter may be sent asking for guidance. Educators are like physicians in giving freely and willingly their best advice and service to rich and poor alike.

I will gladly send to any physician on request a list of the schools for the deaf in this country and Canada, classified according to method of instruction and location, where a deaf child can be educated free of charge.

John Dutton Wright,
1 Mount Morris Park, West, New York City.

Note on Present Condition of Patient in Case of Implantation of Testes, Previously Reported

To the Editor:—Last May (The Journal, May 13, 1916) I reported a case of double implantation of testes, taken from the dead body, in a subject who had lost both testes. This report comprised the details of the operation and the condition of the patient and of the implanted organs seven months after the implantation. The patient reported, Aug. 15, 1916, one year and fifteen days after the implantation. I found that, while a moderate degree of atrophy of the implanted organs had occurred, they were still much in evidence, being about the size of the testes of a boy of 10 or 12 years of age. They were firm, of fairly normal contour, and the epididymides were plainly definable. The sexual function was normal and more than ordinarily vigorous. The patient stated that, when conditions were favorable, he was in the habit of having satisfactory coitus every other day. He also stated that his muscular vigor was exceptional, and that he could hold his own again in various forms of athletics. He expressed himself as so well satisfied with results that, should it become necessary, he would gladly submit to a repetition of the implantation.

G. Frank Lydston, M.D., Chicago.

Dr. de Tarnowsky vs. Jenner Medical College

To the Editor:—The annual announcement of Jenner Medical College has just been sent me, and I find my name listed in its faculty as professor of surgery. The only connection I have had with Jenner Medical School has been through some of their students attending my Cook County Hospital clinics, which are open to students and graduates of all schools.

George de Tarnowsky, M.D., Chicago.

Queries and Minor Notes

Anonymous Communications and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

POWERS OF HEALTH OFFICERS

To the Editor:—Please answer the following questions: Has a municipal or city board of health the authority to prevent entrance into that state or municipality of a person suffering from an infectious disease, and traveling in a private conveyance? For example: A child suffering from diphtheria and needing antitoxin and hospital treatment is being carried by a private conveyance to a hospital in a neighboring city. Can the health officers of this neighboring state or city prevent the entrance in a private conveyance of the patient mentioned? If so, must this duty be especially designated or will the general state law allow that much executive action to the health officers?

R. D. T.

Answer.—Generally speaking, most state health laws vest the state health officer or some similar official with the power to quarantine against the entrance of infectious diseases. These laws give this official the further power of making rules and regulations vesting local officials with a like power of quarantine. Many of these health laws frequently vest local officials with this power, usually subject, however, to the state health officers.

The health laws of many Southern states frequently specifically mention railways and vessels as being subject to the regulation of health officers, state or municipal. Under one rule of construction, a law thus specifically mentioning certain things thereby impliedly excludes other things which might be of the same class. But in this case the power of a health officer to prevent the entrance into a state of a person infected with a communicable disease would not necessarily come from this section, but would come from the general powers vested in the health officers under the health laws. The quarantine of the case would not be because of the conveyance but because of the disease. A state may so quarantine under that power which is called the police power and which gives a state the right to protect itself against another state. Subdivisions of a state, such as a county or a municipality, have a similar right of power when so vested therewith either by the health officers or the state health law, such as the state law giving the local governing bodies powers to regulate controllable diseases. See Chapter 22, Article 3, Sections 736, 739, and Chapter 228, Article 1, Section 7061, Alabama Laws; Chapter 4348, Sections 1117, 1118, 1120, Florida Laws, and Sections 1463, 1662, Georgia Political Code.

RESUSCITATION FROM DROWNING

To the Editor:—Please answer the following questions: 1. What are the most approved methods for resuscitation of the drowned? 2. What is the longest time that a person can remain submerged in water and live, and is resuscitation possible after one hour's submersion? 3. Is the so-called Scandinavian method of holding the head of the patient under water scientific, and has it been adopted by the United States government? 4. Please refer me to references on the general subject of resuscitation.

E. P. Strathern, M.D., St. Peter, Minn.

Answer.—1. The method of resuscitation advised in government bulletins and by the Commission on Resuscitation from Electric Shock is that of Schäfer. The patient is held with the head down so that the water may run out of the lungs by gravity. He is then placed flat on his abdomen. The operator stands straddle over the patient and makes alternately pressure and relaxation with both hands on the base of the thorax about twenty times a minute. It has been shown that by this procedure more air is moved than by the older Silvester method. The use of some simple apparatus to inflate the lungs rhythmically is probably of more value than simply external pressure. It is important that the manual method be not neglected if the more elaborate apparatus is not on the spot. The use of oxygen is rational. Cardiac massage, the injection of epinephrin into an artery followed by saline solution, as advocated by Crile, and the direct injection of epinephrin into the pericardial sac may be a useful procedure if the conditions are such that they can be practically carried out. The respiration usually fails long before the circulation. It has been suggested that whenever any form of direct inflation of the lungs is attempted, pressure be made on the rigid trachea, thus collapsing the esophagus; otherwise the air will simply inflate the stomach.

2. It is not definitely known how long a person may be under water and be revived. The statements as to the actual

time a person has been submerged are often untrustworthy. If syncope takes place at once and no water enters the lungs, the individual will live much longer than if he had attempted to breathe under water.

3. The idea of siphoning the water out of the lungs by keeping the head submerged seems irrational because this would probably not form a siphon in any sense.

4. The following are some recent references on the subject of resuscitation:

Schäfer, E. A.: Artificial Respiration in Its Physiologic Aspects, THE JOURNAL, Sept. 5, 1908, p. 801.
Henderson, Yandell: Resuscitation Apparatus, THE JOURNAL, July 1, 1916, p. 1.
Frazier, C. H.: Resuscitation by Cardiac Massage, THE JOURNAL, May 20, 1911, p. 1448.
Dooley, D. H.: On Resuscitation, *Univ. Missouri Bull.*, October, 1913.
The Resuscitation of the Heart After Arrest, editorial, THE JOURNAL, Jan. 1, 1916, p. 32.
Gunn, J. A., and Martin, P. A.: Intrapericardial Medication and Massage in the Treatment of Arrest of the Heart, Jour. Pharmacol. and Exper. Therap., 1915, vii, 31.

NAPHTHALENE IN GASOLINE FOR AUTOMOBILES

A subscriber has sent in some tablets with a circular advertising Inajiffi (Inajiffi Fuel Company, Akron, Ohio). The circular reads in part:

"More Power for Less Money
IMPORTANT
To Automobile, Motorcycle,
Motorboat Owners,
Operators and Dealers
Inajiffi Prepared Gasoline is 100% Efficient.
Contains neither Alcohol, Acid, Ether
or Camphor.
Serves You Quickly, Faithfully, Economically
You will Never Know the meaning of Real Engine Economy and Efficiency until you experience the quiet, smooth, easy-running and augmented power features produced by INAJIFFI."

The tablets were submitted for examination to our chemists, who report:

The tablets had the odor of naphthalene and also the general physical properties of this substance; the material of the tablets melted at about 80 C., and this melting point was not changed materially when the powdered tablet was mixed with naphthalene; it was readily and completely soluble in chloroform, and burned on ignition without leaving an appreciable residue. When the material was treated to form the picrate according to Mulliken (Identification of Organic Compounds, i, 201) a substance was obtained which melted at from 150.5 to 151.5 C., uncorrected. This agrees closely with the melting point of naphthalene picrate, which is stated to melt at 150 C., uncorrected. The examination shows that the tablets consist to a large extent, if not entirely, of naphthalene.

We publish this note to suggest to our readers that before investing in any of the hundred and one accessories and "improvements" sold in connection with automobiles, they obtain reliable, unbiased opinions as to the merits of the contrivance in question.

Because of its high carbon content, naphthalene, when dissolved in gasoline, does add some energy, but its solubility is so low that the gain is negligible. Certainly in the present instance the addition of the few tablets the dealers recommend is so small that the effect would not be noticeable. But if the addition of this small quantity did produce appreciable augmentation of energy, why not buy naphthalene in the form of mothballs?

BORDET-GENGOU BACILLUS — ETIOLOGY OF WHOOPING COUGH — PERTUSSIS VACCINE

To the Editor:—1. Can you tell me something about the Bordet-Gengou bacillus used in the preparation of Mulford's pertussis vaccine? 2. Is the etiology of whooping cough proved? 3. Has the vaccine given satisfactory results as treatment or as prophylaxis?

HAROLD G. GEGGIE, M.D., Wakefield, R. I.

ANSWER.—1. The Bordet-Gengou bacillus was first described in 1906. It is somewhat larger than *Bacillus influenzae*. It occurs singly and in groups. It has rounded ends, is nonmotile, and possesses no flagella. It has neither capsules nor spores. It stains poorly with ordinary anilin dyes, and is gram-negative. It stains readily with carbol-methylene blue, carbol toluidin blue and methylene blue. Unlike the influenza bacillus, it can be made to grow in mediums which do not contain hemoglobin. Bordet and Gengou recommend a potato-glycerin-blood agar medium. The organism is aerobic.

2. The etiology of whooping cough has been a controversial subject for several years. It is now generally believed that the Bordet-Gengou bacillus is the cause of whooping cough. This organism is found in the majority of cases, and has not been isolated from those free from the disease.

3. According to New and Nonofficial Remedies, 1916, irregular but somewhat encouraging reports of the use of vaccines of this bacillus are available. In general, the evidence indicates that it is of value both for prevention and for treatment, although some writers report that results have not been satisfactory. Four preparations are described in New and Nonofficial Remedies.

The following references may also be consulted:

Hess, A. F.: Use of a Series of Vaccines in Prophylaxis and Treatment of an Epidemic of Pertussis, THE JOURNAL, Sept. 19, 1914, p. 1007.
Whooping Cough, Therapeutics, THE JOURNAL, Jan. 30, 1915, p. 434.
Cause of Whooping Cough — Value of Pertussis Vaccine, Queries and Minor Notes, THE JOURNAL, Aug. 29, 1914, p. 796.
Pertussis and Vaccination, editorial, THE JOURNAL, Aug. 21, 1915, p. 724.

VACCINES IN PERTUSSIS

To the Editor:—There are so many bacterial vaccines on the market that the general practitioner is confused and uncertain as to their use. What is the concensus of opinion as to their value in pertussis?

A. B. FITCH, M.D., Factoryville, Pa.

ANSWER.—See reply to question three in letter above to Dr. Geggie.

USE OF PARAFFIN BY FRENCH ARMY SURGEONS

To the Editor:—Can you give briefly the paraffin method used by the French army surgeons of treating burns? I understand that they use such a method with great success.

C. C. GREEN, M.D., Beaver City, Neb.

ANSWER.—It may be that our correspondent refers to the use of a proprietary preparation, to which reference has already been made. See Current Comment entitled "Miracles in the War Zone," THE JOURNAL, Aug. 12, 1916, p. 516; also a Query and Minor Note, p. 535 of the same issue. It is possible, however, that he is referring to the method mentioned by our Paris correspondent in the communication published in THE JOURNAL, Jan. 22, 1916, p. 290, from which we quote the following:

INJECTIONS OF PETROLATUM AND SOFT PARAFFIN IN FISTULOUS TRACTS PRODUCED BY WOUNDS OF WAR

Dr. Marquis of Rennes has reported to the Société de chirurgie de Paris some excellent results given by injections of a mixture of petrolatum and soft paraffin in cases of serious lacerations, the repair of which seems difficult or likely to be indefinitely prolonged and especially in large fistulous tracts where drains had been placed for a long time. After various attempts at forming a mixture with a higher melting point than petrolatum, which, melting at 40 C. (104 F.), is absorbed by the dressing, Marquis decided on a mixture of nine parts of petrolatum and one of soft paraffin. This petrolatum and paraffin mixture, melted in a water bath, is injected into the fistula with a syringe of 20 c.c. while a tampon closes the opposite orifice of the fistula. These injections are repeated every day or every two days. Before this treatment, fragments of projectile, of clothing and of bone should be carefully removed from the wounds. It is not necessary to wait until suppuration has completely ceased but it should not be profuse.

These injections of petrolatum and paraffin are painless, and they shorten the time of healing of fistulous tracts considerably.

DEATH FOLLOWING BLOW ON HEAD OR SOLAR PLEXUS

To the Editor:—A man dies immediately following a blow by a fist on his neck or face. Necropsy reveals no fracture or hemorrhage in or within the cranium or spinal canal, and no pathologic condition of the heart, coronary arteries or kidneys. What might be the cause of death? Would it be possible for a blow over the solar plexus to cause immediate death? Kindly omit name and address in answer.

A. R. V.

ANSWER.—A blow on the head may be followed by concussion of the brain or shock, either of which conditions may give rise to immediate death without any noteworthy necropsy findings. The pathology of shock is still imperfectly understood, but in some cases death is probably due to vasomotor or cardiac paralysis. Blows falling in the epigastric region over the large plexus of sympathetic nerves may cause immediate death. The cause of death in such instances is probably a cardiac or respiratory paralysis which may not be accompanied by any gross anatomic changes. The subject is discussed in all good textbooks on legal medicine.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

California: Los Angeles, Oct. 3. Sec., Dr. Charles B. Pinkham, Room 527 Forum Bldg., Sacramento.

Colorado: Denver, Oct. 3. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

Georgia: Atlanta, Oct. 10-12. Sec., Dr. C. T. Nolan, Marietta.

Idaho: Wallace, Oct. 3. Sec., Dr. Charles A. Dettman, Burke.

Illinois: Chicago, Oct. 10-12. Sec., Dr. C. St. Clair Drake, Springfield.

Iowa: Des Moines, Oct. 17-19. Sec., Dr. Guilford H. Sumner, State House, Des Moines.

Kansas: Topeka, Oct. 10-12. Sec., Dr. H. A. Dykes, Lebanon.

Michigan: Lansing, Oct. 10-12. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

Minnesota: Minneapolis, Oct. 3-6. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.

Mississippi: Jackson, Oct. 24-25. Sec., Dr. J. D. Gilleylen, Jackson.

Missouri: Kansas City, Sept. 18-20. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

Montana: Helena, Oct. 3. Sec., Dr. William C. Riddell, Helena.

New York: Albany, Buffalo, New York and Syracuse, Sept. 19-22. Mr. Harlan H. Horner, Chief Examinations Division, The University of the State of New York, State Department of Education, Albany.

Porto Rico: San Juan, Oct. 3. Sec., Dr. Quevedo Baez, San Juan.

Illinois May Report

Dr. C. St. Clair Drake, secretary of the Illinois State Board of Health, reports the written examination held at Chicago, May 4-6, 1916. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 166, of whom 154 passed and 12 failed. Two candidates did not complete the examination. The following colleges were represented:

PASSED		
College	Year Grad.	Total No. Licensed
Howard University	(1912)	1
Bennett Medical College	(1914) (1915, 6)	7
Chicago Coll. of Med. and Surg.	(1914) (1915, 4) (1916, 21)	26
Chicago Hospital College of Medicine	(1916)	1
College of Physicians and Surgeons, Chicago	(1910)	1
Hahnemann Medical College and Hospital, Chicago	(1916)	4
Jenner Medical College	(1915)	1
Loyola University	(1916)	24
Northwestern University	(1915, 3) (1916, 14)	17
Rush Medical College	(1911) (1916, 22)	23
University of Illinois	(1911) (1914) (1916, 41)	43
State University of Iowa, College of Medicine	(1890)	1
Boston University	(1903)	1
Meharry Medical College	(1911) (1914) (1915)	3
National University of Arts and Sciences	(1914)	1

FAILED		
Bennett Medical College	(1915)	1
Chicago Hospital College of Medicine	(1915)	3
College of Med. and Surg., Physio-Med., Chicago	(1910)	1
Rush Medical College	(1901)	1
University of Louisville	(1911)	1
Detroit College of Medicine	(1904)	1
Meharry Medical College	(1912) (1913) (1914)	3
University of Pennsylvania	(1906)	1

Florida June Report

Dr. E. W. Warren, secretary of the Regular Board of Medical Examiners of the State of Florida, reports the written examination held at Jacksonville, June 13-14, 1916. The total number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 61, of whom 50 passed and 11 failed. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
Atlanta College of Phys. and Surgs.	(1909) 77; (1910)	80
Atlanta Medical College	(1915) 82, 85; (1916) 77, 77, 78, 78, 78, 81, 83, 83, 84, 84, 87, 89, 90, 91	
Southern College of Medicine and Surgery	(1914)	78
University of Georgia	(1916)	80
Bennett Medical College	(1913) 87; (1914)	75
Medical College of Evansville	(1878)	73 *
Louisville Medical College	(1892) 72;* (1895)	81
Tulane Univ. of Louisiana	(1913) 76; (1914) 83; (1916)	76
Baltimore Medical College	(1896)	77
Johns Hopkins University	(1908)	75
Harvard University	(1914)	76
Saginaw Valley Medical College	(1903)	75
Washington University	(1892)	71 *
Dartmouth Medical School	(1895)	89
Bellevue Hospital Medical College	(1894)	77
Columbia University, College of Phys. and Surgs.	(1904)	79
Jefferson Medical College	(1916)	90, 90
University of Pennsylvania	(1911) 84; (1915)	84
Medical College of the State of South Carolina	(1916)	89
Meharry Medical College	(1915) 76; (1916)	79, 87
Vanderbilt University	(1916) 85,	85, 91
University of Texas	(1916)	84, 87
University of Virginia	(1897)	93

FAILED		
Birmingham Medical College	(1915)	71
Atlanta Medical College	(1915)	70
Rush Medical College	(1899)	65
Physio-Medical College of Indiana	(1886)	40
Kansas Medical College	(1909)	68
Hospital College of Medicine, Louisville	(1896)	61
University of Louisville	(1910)	68
Physio-Medical Institute, Cincinnati	(1876)	26
Meharry Medical College	(1915) 57; (1916)	73
University College of Medicine, Richmond	(1907)	59

* Credit allowed for years of practice.

Kentucky June Report

Dr. A. T. McCormack, secretary of the Kentucky State Board of Health, reports the written examination held at Louisville, June 13, 1916. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 70. The total number of candidates examined was 70, of whom 64 passed, including 3 osteopaths, and 6 failed, including 1 osteopath. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1913)	85
Louisville National Medical College	(1912)	70
University of Louisville	(1915) 80; (1916) 70, 74, 75, 76, 77, 77, 77, 78, 79, 80, 81, 81, 82, 82, 82, 82, 82, 82, 82, 83, 83, 83, 84, 84, 85, 85, 86, 86, 86, 86, 87, 87, 90	
Johns Hopkins University	(1914)	89
St. Louis College of Physicians and Surgeons	(1915)	74
Eclectic Medical College, Cincinnati	(1916)	83, 92
University of Cincinnati	(1916)	87
University of Pennsylvania	(1914) 92; (1916)	85
Lincoln Memorial University	(1916)	84
Meharry Med. Coll.	(1908) 72; (1915) 79; (1916) 71, 74, 76, 76, 81	
Memphis Hospital Medical College	(1911)	73
University of Tennessee	(1900)	82
Vanderbilt University	(1909) 93; (1912) 71; (1916) 83, 88, 89, 91	

FAILED		
Louisville Medical College	(1907)	38 *
Louisville National Medical College	(1912)	62
University of Louisville	(1912) 63; (1916)	75 †
University of Nashville	(1908)	62 *

BY SPECIAL ORDER OF THE BOARD

PASSED		
College	Year Grad.	Total No. Licensed
American Eclectic Medical College	(1894) *	1

* Graduation not verified.

† Fell below the required average in two subjects.

Colorado July Report

Dr. David A. Strickler, secretary of the Colorado State Board of Medical Examiners, reports the written examination held at Denver, July 5, 1916. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 20, of whom 19 passed, including 4 osteopaths, and 1 osteopath failed. Three other candidates who entered the examination were dismissed by request. Eighteen candidates were licensed through reciprocity. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent.
University of Colorado	(1916) 82, 83.7, 83.9, 85, 85.1, 85.1, 85.8, 86.4, 86.7, 87.3, 90.2	
Harvard University	(1916)	86.7
Lincoln Medical College	(1909) 76.1; (1910)	79
Vanderbilt University	(1915)	88.9

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
College of Physicians and Surgeons, Chicago	(1901)	Illinois
Rush Medical College	(1915)	Mississippi
University of Kansas	(1906)	Kansas
Maryland Medical College	(1907)	Delaware
Detroit College of Medicine	(1901)	Michigan
University of Michigan Medical School	(1893)	Oregon
Marion Sims College of Medicine	(1893)	Missouri
St. Louis College of Physicians and Surgeons	(1897)	Missouri
University Medical College, Kansas City	(1897)	Iowa
John A. Creighton Medical College	(1907)	Iowa
University and Bellevue Hospital Medical College	(1911)	New York
Starling Medical College	(1893)	S. Dakota
Medico-Chirurgical College of Philadelphia	(1912)	Penna.
University of Pennsylvania	(1908)	Penna.
University of Tennessee	(1914)	Tennessee
Vanderbilt University	(1909)	Missouri
University of Vermont	(1908)	Vermont
Imperial University, Tokyo	(1905)	Utah

Book Notices

PULMONARY TUBERCULOSIS. By Maurice Fishberg, M.D., Clinical Professor of Tuberculosis, New York University. Cloth. Price, $5 net. Pp. 639, with 119 illustrations. Philadelphia: Lea & Febiger, 1916.

This book is presented to supply the general practitioner with information on the etiology, diagnosis, prognosis and treatment of pulmonary tuberculosis, its clinical forms and common complications. An experience of eighteen years with tuberculosis problems in New York has laid the foundation for this task. The author gives the results of his personal experiences, and furnishes many valuable references on every phase of the problem. The home treatment of tuberculosis, the importance of constitutional symptoms, tuberculosis in the aged, and the importance of economic conditions as affecting the diminution of tuberculosis are considered. A strong distinction is drawn between active disease and tuberculous infection. Physical diagnosis and roentgenography are gone into minutely. In treatment, attention is given to psychotherapy and the wise use of available means, considering the pocketbook of the patient. In the discussion of medicinal treatment, the use of tuberculin is condemned. Artificial pneumothorax is clearly set forth. Some omissions are noted, one of these being the lack of citation or reference to the standard Turban or National Association classification of tuberculosis. Too great stock is taken in the childhood immunization against tuberculosis with a consequent neglect in completely considering prophylaxis and prevention in the adult. In spite of a number of minor statements which may be questioned, the book is full of interesting and enlightening information concerning pulmonary tuberculosis.

A TEXT-BOOK OF PATHOLOGY. By W. G. MacCallum, Professor of Pathology in the College of Physicians and Surgeons, Columbia University, New York. Cloth. Price, $7.50 net. Pp. 1085, with 575 illustrations. Philadelphia: W. B. Saunders Company, 1916.

Dr. MacCallum has written this book evidently with the diseases of the body in mind, discussing the pathology of each condition on the basis of etiology. The book is a treatise on medicine as well as a pathologic textbook. He describes many specific cases illustrative of the conditions discussed; such case reports add greatly to the practical value and interest of the book. After each chapter references to literature are given, chiefly with a view to enable the student who wishes to study any subject further.

The author points out continuously the limitations of our knowledge. He says of cloudy swelling:

"All this is very contradictory and confused, but at least one may see that it is scarcely believed any longer that the granular opacity of the organ cells in infections and intoxications is due to the accumulation of protein food materials, but that it is intimately related to changes in the specific granules of the cell. More study is necessary to make the matter quite clear."

Of hyaline degeneration:

"This expression is loosely employed to class together, in the present state of our ignorance, a great many unrelated substances, usually recognizable only with the microscope, which have in common, besides their protein nature, only their translucent clear or hyaline appearance and their tendency to stain brightly with such acid dyes as eosin."

In discussing new growth of tissue and tissue repair, he says:

"Very vague, too, are our notions about the substances which cause the sudden new-growth of tissue at the onset of puberty, and especially those which produce the remarkable changes in the breasts and other organs in pregnancy."

Particularly interesting is the author's discussion of arteriosclerosis. After discussing numerous views which have been advanced, he says:

"It seems more probable that, as the French have so long suggested, arteriosclerosis is the effect of some injurious or poisonous agent acting upon the intima of the arteries, as it might upon any other organ, with destruction, fat accumulation, and repair. What this agent may be is as yet uncertain."

In the discussion of shock the recent experimental studies have been considered. A chapter of particular interest is that devoted to the effects of light, radiant energy and electricity on the tissues. The clinical method of the study is particularly well illustrated in that section of the book devoted to the pathology of the conduction bundles of the heart. This includes a brief discussion of the mechanism by which recent studies have been made and illustrates by electrocardiographic curves the results of the various changes in the condition of the heart tissues. On page 504 two exceptional case reports are given which are illustrated with photographs of lesions resulting from a staphylococcus septicemia. Special sections are devoted to the various acute infections; the chapter on poliomyelitis being particularly interesting at this time.

The book is based on the course in the subject which the author gives at the College of Physicians and Surgeons of Columbia University, New York. Several sections usually included in books on pathology, for instance, the biology of bacteria and other parasites, malformations, and many diseases of the nervous system—are not discussed, and little is said of resistance and immunity. The book is not, therefore, a complete reference book on the subject of pathology. It is, however, one of the most practical and interesting modern books on the subject. There are 575 excellent illustrations, practically all new and especially prepared for this book from specimens in the department of pathology headed by Dr. MacCallum.

A MANUAL FOR FIRE PREVENTION AND FIRE PROTECTION FOR HOSPITALS. By Otto R. Eichel, Director, Division of Sanitary Supervisors, New York State Department of Health. Cloth. Price, $1 net. Pp. 69. New York: John Wiley & Sons, 1916.

In this book Eichel states the significant points concerning fire prevention and protection which should be borne in mind by those interested in hospital construction and management. Local and state restrictions and the requirements of insurance underwriters are now so systematized that the hospital superintendent could not neglect this subject, even were he careless. The author emphasizes the importance of prevention rather than protection. He outlines the minimum amount of equipment which hospitals should possess for overcoming incipient fires. In three chapters he outlines various dangers which must be particularly guarded against. The most important and, perhaps, the best part of the book is that dealing with the hospital fire department. The author outlines a scheme for the organization of hospital attendants for action during fires, and describes the conduct of the fire drill. He also indicates recent literature of service in connection with this work. While the book contains nothing new to those acquainted with the general aspects of the subject, it will serve as a timely reminder to hospital superintendents and others that fire is an ever present menace.

Miscellany

Pulmonary Tuberculosis Survey in Cincinnati

Public Health Bulletin 73 contains a report on an investigation into pulmonary tuberculosis in Cincinnati. Though published under the title "Tuberculosis Among Industrial Workers," its scope is wide, as it covers also predisposing causes. The survey was originally undertaken at the request of the board of health and of the Antituberculosis League of Cincinnati, in order to determine to what degree the high phthisis death rate of that city was influenced by industrial conditions. In order to ascertain what effect, if any, occupation has on pulmonary tuberculosis, Surgeons Robinson and Wilson inspected 154 factories, representing thirty-eight different industries, and examined 19,932 persons. The second part of the inquiry related to the predisposing causes of tuberculosis in cases reported to the board of health. The housing and economic conditions of families of the tuberculous were studied in detail. In the same way it was endeavored to ascertain what had been the most prominent predisposing factors of the disease among the inmates of the municipal tuberculosis hospital. Meteorologic conditions and the prevalence of Ohio river floods were also collated with the regional prevalence of pulmonary tuberculosis. The prevalence of other diseases usually considered as predis-

posing to tuberculosis was carefully investigated and, finally, consideration was given to the racial character and rate of growth of the population. The conclusions are that:

1. Climatic conditions, floods and prevalence of other diseases have no influence on the death rate from pulmonary tuberculosis in Cincinnati.

2. Occupational hazard has been one of the factors predisposing to tuberculosis in a considerable number of cases, but there seems no reason to believe that this cause is more active in Cincinnati than elsewhere.

3. The fact that the white population has a larger proportion of Germans and of Irish, and a small proportion of Jews and of Italians, together with the large number of colored people, is shown to be one of the reasons for the high tuberculosis death rate.

4. The comparative slowness of the growth of the city has had a similar effect because, among other reasons, it inhibits the destruction of old and the building of new houses.

5. Poor economic conditions, bad housing and the inadequacy of financial relief for families whose wage earner is tuberculous, form a closely interrelated group of factors for the causation and maintenance of a high tuberculosis death rate.

6. Insufficient provision for the care of incipient cases, insufficient knowledge as to the distribution of persons afflicted with the disease, inadequate cleansing and disinfection of houses and rooms vacated by consumptives and inadequate segregation of advanced cases were found to be among the most important causes of the high death rate.

The recommendations follow from these conclusions, and they are:

1. Institution of measures whereby a more accurate knowledge can be had of the whereabouts of all cases.

2. Strict medical surveillance over families in which tuberculosis exists.

3. Medical examination of industrial workers.

4. Improvement in sanitary and hygienic conditions in work places; the improvement of home conditions by providing sanitary homes.

5. Revision of the building code and the placing of tenement house inspection with the health department.

6. Increased segregation of advanced cases.

7. State industrial insurance to enable workers' families to be provided for while remedial measures are being carried out.

8. Medical examination of lodging house inmates.

9. The erection of a sanatorium for the treatment of incipient cases.

Inosite as a Food

It is more than sixty years since inosite, hexahydroxybenzene, $C_6H_{12}O_6$, was first described as a constituent of muscle by Scherer (*Ann. Chem.*, 1850, lxxiii, 322). The identity of its empiric formula with the hexose carbohydrates like glucose, and the widespread distribution which inosite was soon found to have in the tissues and fluids of animal structures, as well as in the plant kingdom, served to arouse considerable physiologic interest in the compound. Students of a generation ago will recall in particular the attempt to establish some sort of relation between inosite and the carbohydrates. Külz of Marburg, to whom we owe many important observations in the field of the pathology of diabetes, fed large quantities of inosite to healthy persons and also to diabetics. In neither case was he able to recover more than insignificant amounts of the compound from the urine; and inasmuch as the diabetics showed no increased elimination of sugar after ingestion of inosite, Külz concluded at one time that the new substance might be available in the diabetic organism as a source of energy in place of sugars (Külz, E.: *Beitr. Path. u. Therap. d. Diabetes Mellitus*, 1874, i).

It is apparent, however, that, instead of being oxidized in the body, inosite given by mouth may be lost again with the feces, destroyed by the micro-organisms of the alimentary tract, or stored up in some tissue. In none of these cases would it reappear in the urine unchanged, yet it would not be a source of energy to the organism. The best test of the oxidative metabolism or combustion of a substance in the body is furnished by studies with the respiration apparatus in which the consumption of oxygen and the production of carbon dioxid can be measured accurately. The ratio of these values, that is, the respiratory quotient, CO_2/O_2, ascertained under suitably controlled conditions, gives an index to the nature of the metabolism in the body. A substance of carbohydrate nature tends to raise the quotient toward unity.

If inosite were oxidized in the body in the same manner as the carbohydrates or glucose, for instance, then a rise in the respiration quotient might be expected. R. J. Anderson (The Utilization of Inosite in the Dog, *Jour. Biol. Chem.*, 1916, xxv, 391; Anderson, R. J., and Bosworth, A. W.: The Utilization of Inosite in the Animal Organism, *ibid.*, 1916, xxv, 399) put the problem to the exact test in an experimental animal. In the case of the dog he found that inosite is not utilized to any extent. It is neither stored nor oxidized in the body, but the greater part is excreted unchanged. Even as much as 2 gm. per kilogram of body weight do not cause any appreciable rise in the respiratory quotient. The reason is not far to seek. More than three quarters of the amount of inosite fed has been recovered from the excreta. It is absorbed very slowly from the intestine; hence it may cause more or less severe diarrhea, and only a small portion leaves the body through the kidneys.

Of late there has been considerable discussion of a compound, phytin, which represents inosite conjugated with phosphoric acid, presumably as a rule as inosite hexaphosphoric acid, in which form it is widely distributed in the seeds, roots and tubers of plants. (An elaborate review of the subject has been prepared by Rose, A. R.: *Biochem. Bull.*, 1912-1913, ii, 21). Phytin has appeared in the medical literature endowed with a great variety of problematic virtues, most of them attributed to the *organic* combination of phosphoric acid. Little has been said about the inosite component of the molecule; indeed, it was not until comparatively recent years that inosite was understood to be the organic component of the phytin molecule. When phytin is fed, inosite is presumably liberated in the digestive tract. The evidence recently obtained by Anderson and Bosworth at the New York Experiment Station, Geneva, gives no promise of nutritive value to inosite in the organism of man. Their results confirm earlier observations that inosite given by mouth disappears without more than very small quantities appearing in the urine. When inosite is taken by human subjects at the rate of about 0.5 gm. per kilogram of body weight per day, it produces some diarrhea at first or frequent soft stools. After a few days the stools, although more frequent than usual, are likely to be of nearly normal consistency. Anderson and Bosworth observed no marked or appreciable effect on the metabolism of man. Inasmuch as less than 10 per cent. of the inosite ingested was eliminated unchanged in the urine and none was found in the feces, it remains to be ascertained whether it was destroyed by alimentary bacteria; for the negative observations on dogs make it highly improbable that inosite is burned up in the body.

Society Proceedings

COMING MEETINGS

Am. Assn. for the Study and Prev. of Inf. Mort., Milwaukee, Oct. 19-21.
Am. Assn. of Obstetricians and Gynecologists, Indianapolis, Sept. 25-27.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
American Public Health Association, Cincinnati, Oct. 24-27.
American Roentgen Ray Society, Chicago, Sept. 27-30.
Clinical Congress of Surgeons, Philadelphia, Oct. 23-28.
Idaho State Medical Association, Twin Falls, Oct. 5-6.
Indiana State Medical Association, Ft. Wayne, Sept. 27-29.
Kentucky State Medical Association, Hopkinsville, Oct. 24-27.
Minnesota State Medical Association, Minneapolis, Oct. 11-13.
Missouri Valley Medical Society, Omaha, Sept. 21-22.
Nevada State Medical Association, Reno, Oct. 10-12.
New England Surgical Society, Boston, Oct. 5-7.
New Mexico Medical Society, Albuquerque, Oct. 11-13.
Pennsylvania State Medical Society, Scranton, Sept. 18-21.
Virginia State Medical Society, Norfolk, Oct. 24-27.
Wisconsin State Medical Society, Madison, Oct. 4-6.

Medicolegal

No Direct Claim Against Employer for Services to Employee

(Bloom vs. Jaffe (N. Y.), 157 N. Y. Supp. 926)

The Supreme Court of New York, Appellate Term, First Department, reverses a judgment for $21 obtained by the plaintiff, a physician, for medical services to an injured workman, and dismisses his complaint, with costs. The court says that it was conceded at the trial that the workmen's compensation commission had fixed the physician's compensation at $21, by which the parties apparently meant that the commission approved a claim for services of this amount and included it in the award to the workman, as provided by Section 24 of the New York workmen's compensation law. The employee assigned the award, or this portion of it, to the plaintiff, who, on these facts, was awarded the judgment for $21 against the defendant, who was apparently the employer of the injured workman. It seems to the court quite plain that the plaintiff physician had no cause of action. At common law a physician who rendered services to an injured employee had no right of action against the employer, although the injured employee in a proper case might have recovered the reasonable value of such services as part of his own damages. The workmen's compensation act has given an injured employee a new kind of remedy, and seeks to compensate him for all injuries suffered in the course of his employment, regardless of whether these injuries were caused by the negligence of his employer. As part of this compensation it provides in Section 13 for medical service at the expense of the employer, and where the employee has been compelled to procure such service himself the law makes provision for the inclusion of a claim for such service in the award made to the employee. The primary purpose of the statute is not, however, to provide compensation to the physician, but solely to provide compensation to the injured employee for such medical service as the law permits him to procure at the expense of the employer. It does not, therefore, provide for any award to the physician, but merely gives the physician a lien on the compensation awarded to the workman, which "shall be paid therefrom only in the manner fixed by the commission." In this case the plaintiff was not seeking to enforce his lien on the compensation awarded to the employee, but was seeking to recover the amount directly from the employer. Moreover, even if he were seeking to enforce his lien on the award in a direct proceeding before the commission, he would be bound to know that the commission had fixed the manner of its payment. The assignment from the injured employee could give him no right of action, because the statute expressly declares that claims for exemptions or benefits due shall not be assigned. In basing this decision on the ground that no award had been made to the plaintiff which he could enforce against the defendant, the court does not desire to imply that in any event payment of an award could be enforced against the employer, except by action instituted by the commission as provided in Section 26. The plaintiff had under no circumstances any direct claim for compensation against the employer.

Unlawful Practicing of Medicine by Clairvoyant — Evidence

(Commonwealth vs. Lindsey (Mass.), 111 N. E. R. 869)

The Supreme Judicial Court of Massachusetts, in overruling exceptions to the conviction of the defendant of unlawfully practicing medicine, says that, if the defendant was a clairvoyant and as such came within the exception of the Massachusetts statute, he could not prescribe medicine for the cure of disease, even if the diagnosis of it and the kind of medicines prescribed were revealed to him through clairvoyance. Near the street door of the building in which he carried on his business was the sign, "Dr. Willard M. Lindsey, Inc." This was the name of a corporation of which he was the president. He also was the president of another corporation, The Magnetic Sanitarium Company. It was plainly for the jury to say whether, in the sale of the medicines, he was acting entirely as the agent of the corporations, or was engaged at the time in the practice of medicine. His guilt or innocence was to be determined by what he actually did. It was not to be determined by what he purported to do. A requested instruction to the jury was properly denied, which stated that, if the people who consulted the defendant believed him to be a clairvoyant and the defendant purported to treat them by that method of treatment or if he purported to ascertain their physical condition by means of clairvoyance, it was not important for the jury to decide what constitutes clairvoyance. Nor was it error to permit the commonwealth to introduce evidence of the defendant's acts and conversations on different days between April, 1913, and November, 1914, although the commonwealth had elected to rely on Nov. 24 and 30, 1914, respectively, as the days on which the offenses were committed. While it is a well established rule of law, in the trial of a criminal case, that the commonwealth is not allowed to introduce evidence of other crimes with the purpose of showing the defendant to be guilty of the offense charged, it is equally well established that evidence of other crimes and acts is admissible when they are a part of a common purpose, where the plan or scheme of the defendant is a material circumstance, and when the course of the defendant's business is a matter of importance in passing on his guilt or innocence. Where the several visits and consultations of a patient with one from whom she is receiving medicines are but parts of the same course of treatment, where the speech or conduct of the defendant on one of the occasions may be equivocal, and it is essential to determine the dominant purpose of the defendant on the day of the offense, then the conduct of the defendant on other days, and as a part of the same transaction, may be a matter of great importance, and therefore of probative value. Assuming, as the defendant claimed, that he could sell and deliver drugs and medicines without violating the particular statute under consideration, the commonwealth had a right to meet this defense by showing the plan and purpose of the defendant, as well as his method of business, in order that the jury might determine whether, November 24 and 30, he was acting in the capacity of a salesman or as a physician. As sales of liquor at other times than that alleged have been held admissible as showing the intent with which the specified liquors have been kept, so the intent with which the defendant disposed of his medicines on the days in question, whether as sales of goods to customers or as medicines prescribed by himself, might be shown by his conduct respecting people and medicines in his office on other occasions.

Liability for Insanity Following Injury to Syphilitic Employee

(Crowley vs. City of Lowell (Mass.), 111 N. E. R. 780)

The Supreme Judicial Court of Massachusetts holds that, compensation having been awarded for total incapacity as provided in the workmen's compensation act, the decree should be affirmed, although the city contended otherwise on the ground that no causal connection between the injuries of the employee and the general condition of paresis rendering him insane, and requiring his commitment to an asylum, was shown by the record. The material evidence before the committee on arbitration, submitted without the introduction of further testimony to the industrial accident board on review, warranted the findings, the court says, that the employee had "a preexisting constitutional disease known as syphilis," which, being dormant, left his ability to perform the arduous work for which he was hired unimpaired, and that because of the nature of the accident arising out of and in the course of employment, his nervous system suffered a shock sufficiently severe to aggravate and accelerate this condition, until general paralysis or insanity resulted, depriving him of all capacity for work in the future. The statute prescribes no standard of fitness to which the employee must conform, and compensation is not based on any implied warranty of perfect health, or immunity from latent and

unknown tendencies to disease, which may develop into positive ailments, if incited to activity through any cause originating in the performance of the work for which he is hired. What the legislature might have said is one thing, what it has said is quite another thing, and in the application of the statute the cause of partial or total incapacity may spring from, and be attributable to the injury just as much where undeveloped and dangerous physical conditions are set in motion producing such result, as where it follows directly from dislocations, or dismemberments, or from internal organic changes capable of being exactly located.

Counties Not Liable for Unauthorized Attendance on Poor

(Guerin vs. Clarke County (Wash.), 155 Pac. R. 1035)

The Supreme Court of Washington says, in affirming a judgment in favor of the defendant county, that the plaintiff physician sued the county for professional services rendered in the county to one resident and eight nonresidents indigent, but judgment was properly rendered against him, for he neither had a claim to begin with nor had properly presented one. These persons were not accepted paupers, and no county officer had requested the plaintiff to treat them. Nothing can be plainer, under Rem. & Bal. Code, Sec. 8377 et seq., than that, however much the poor may of a sudden require a physician, a bill for such work cannot be run up against the county without an order from some one in authority. Even were the court to suppose the county under a common-law obligation, this thing has long been regulated by statute. Neither that statute nor reason exposes the counties to what might otherwise become enormous charges, unnecessary services, and feigned situations. These are old statutes and this their old interpretation.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

September, XII, No. 3

1 *Scarlet Fever, Morbidity and Fatality. H. H. Donnally, Washington, D. C.—p. 205.
2 Congenital Dextrocardia with Patent Ductus Ovale. H. J. Morgan, Toledo.—p. 233.
3 *Pyelitis of Infancy. R. M. Smith, Boston.—p. 235.
4 *Acetone Bodies in Blood of Children. F. Moore, Des Moines, Iowa.—p. 244.
5 Types of Pneumococcus Found in Pneumonias of Infants and Young Children. M. Wollstein and A. W. Benson, New York.—p. 254.
6 *Intradermal and Repeated Intradermal Injection of Diphtheria Toxin with Reference to Schick Test. D. M. Cowie, Ann Arbor, Mich.—p. 266.
7 *Epidemiology of Pertussis. P. Luttinger, New York.—p. 290.
8 *Anaphylactic Skin Reaction to Diphtheria Bacilli. J. A. Kolmer and E. L. Moshage, Philadelphia.—p. 316.
9 Sarcoma of Kidney Treated by Roentgen Ray. A. Friedlander, Cincinnati.—p. 328.

1. **Scarlet Fever.**—In all, something over 7,000,000 cases have been collected by Donnally but for various reasons some of these have had to be put aside, only those being retained concerning which it was believed that cases and deaths were well reported. Among approximately 2,000,000 cases there were 104,500 deaths, which gives a case fatality of 5¼ per cent., while the morbidity rate was 3.9, that is, about four persons in each 1,000 inhabitants had scarlet fever, of whom one person in twenty died. Periodicity in the appearance of epidemics of scarlet fever cannot be made out. Morbidity and mortality rates for scarlet fever seem independent of each other. A decline in morbidity has not generally been made out. In cases in which notification has been of longest duration and most thorough (Norway) a reduction in the incidence of scarlet fever has been observed. Season itself does not influence morbidity. The sexes as a whole show equal susceptibility. Under 5 years of age boys are more susceptible, while between 5 and 15 years of age girls are more susceptible than boys. About half of the cases occur in children between 3 and 8 years, and 90 per cent. in those under 15 years of age. About two children out of three between 3 and 8 years of age contract scarlet fever if exposed to it in their homes, if they have not previously had it. Scarlet fever appears to be a milder disease than formerly. Different epidemics may vary greatly in virulence. Scarlet fever has been regularly more prevalent in some places than in others. It has been consistently attended by greater fatality in some places than in others. At all ages males succumb more readily to it than females. Case fatality is lowest in those about 10 to 15 years of age. The younger the child, the less in his chance of recovery. About 90 per cent. of deaths from scarlet fever occur in those under 10 years of age.

3. **Pyelitis of Infancy.**—Smith believes there is sufficient evidence that pyelitis is always a blood infection and that the bacteria frequently gain entrance to the blood by the lymphatics. In the uncomplicated cases the lesion remains localized in the pelvis of the kidney, where the organisms are excreted. Secondary infection of the kidney substance may occur by lymphatic channels from the pelvis. Quite possibly these secondary infections account for many "relapses." The source of the infection in the majority of cases, considering males and females together, is the gastro-intestinal tract. Some cases may arise from infection in the skin, teeth or tonsils or in some local septic process. Many cases in females, accounting for the greater number in this sex as compared with the males, arise from bacteria entering the blood, often via the lymphatics, from the urethra, vulva or vagina.

4. **Acetone Bodies in Blood of Children.**—The blood of sixteen normal children was examined by Moore quantitatively for acetone bodies (beta-oxybutyric acid, aceto-acetic acid and acetone). Expressed as milligrams of acetone per 100 gm. of blood, this was found to vary from 1 to 13 mg., with an average of 6.3 mg. The blood of a normal child after forty-eight hours of voluntary starvation was examined for acetone bodies and found to contain 39.5 mg. acetone bodies per 100 gm. of blood. Acute febrile disturbances are accompanied by an increase in the blood acetone, though this may not be very marked. In some patients showing acidosis clinically, the acetone content of the blood was found to be sufficient to account for the acidosis. Many cases of acidosis in infancy and childhood are not accompanied by an increase of acetone bodies in the blood sufficient to account for the severity of the acidosis. In a given case of acidosis aceturia alone does not indicate that the acidosis is due to an increase of the acetone bodies in the blood.

6. **Intradermal Injections of Diphtheria Toxin, Reference to Schick Test.**—Successive intradermal injections of very dilute solutions of diphtheria toxin (0.00001 c.c. L.+ dose), when given at intervals varying from five to twelve days, Cowie says, provoke the formation of antibodies and in those cases already exhibiting a certain degree of immunity, bring about a definite immunity as recognized by the intradermal test. The degree of immunity induced by such small doses of toxin as are represented by 0.1 c.c. of highly diluted diphtheria toxin, seems to be very slight, and cannot be compared with the results obtained by the use of toxin-antitoxin mixtures. Solutions carrying sufficient toxin to induce immunity when given intradermally are not well borne by the patient.

7. **Epidemiology of Pertussis.**—The number of cases seen by Luttinger in connection with this study exceeds ten thousand. About 80 per cent. of all cases and 97 per cent. of all deaths are in children under 5 years of age. Fifty per cent. of the cases are in those under 2 years of age, and over 50 per cent. of all deaths are in children under 1 year of age. The actual case mortality in whooping cough is difficult to estimate, owing to incomplete returns; it is probably about 1 per cent. The death rate per 100,000 population is about 7. It has been steadily decreasing for the last fifty years having been as high as 58.82 in 1872 and as low as 4.71 in 1908. Whooping cough is transmitted by direct contact and in nearly 60 per cent. of cases the source of infection is

given as coming from a neighbor. Relatives and friends, schools, nurseries, recreation piers and ferries are other sources of infection. Moving picture shows and public conveyances seem to be important factors in the dissemination of the disease. Adult pertussis carriers probably have been disseminating the disease and have remained unrecognized owing to the atypical form in which it manifests itself. Pertussis vaccines, as prepared by the Bureau of Laboratories, when given early, have continued to give good curative and prophylactic results at the Whooping Cough Clinic and in the hands of a large number of private practitioners and health officers. The very small number of deaths under vaccine treatment and the vast crowds who apply for treatment at the clinic indicate a favorable and possibly tangible influence of the specific treatment on the further epidemiology of the disease.

8. **Anaphylactic Skin Reaction to Diphtheria Bacilli.**—In the investigation conducted by Kolmer and Moshage the anaphylactic skin reactions were produced with an emulsion of washed and heat-killed diphtheria bacilli, for which they propose the name "diphtherin"; at the same time the regular Schick test was conducted in each person. Two types of reactions were observed. The first resembled the luetin reaction in all its essential details. The second type of reaction corresponded quite closely with that described by Park and Zingher. The Schick reactions were characterized by areas of erythema, with a brownish tinge measuring from 0.5 to 2 cm. in diameter and accompanied by slight edematous infiltration of the underlying tissues. An anaphylactic skin reaction to the protein of the diphtheria bacillus was observed in about 70 per cent. of children and 35 per cent. of adults following intracutaneous injection of diphtherin. About 53 per cent. of persons of various ages yielded positive diphtherin and negative toxin (Schick) reactions. About 10 per cent. yielded negative diphtherin and positive toxin reactions, both tests agreeing therefore in about 63 per cent. of persons; 12.5 per cent. reacted positively and 24.1 per cent. negatively to both tests. The percentage of positive diphtherin reactions was slightly greater among those who were convalescent from diphtheria. The authors state that while the diphtherin test indicates hypersensitiveness to the protein of the diphtheria bacillus, it has probably no value as an index of immunity and is of practical interest mainly from the viewpoint that the anaphylactic reaction may be mistaken for a positive Schick reaction.

American Journal of Roentgenology, New York

August, III, No. 8

10 Some Causes of Error in Roentgen Diagnosis of Bone and Joint Conditions. R. Hammond, Providence, R. I.—p. 385.
11 Roentgenographic Efficiency of Coolidge Roentgen Ray Tube. S. Gorton and J. A. C. Colston, Baltimore.—p. 388.
12 Plea for Conservatism in Treatment of Closed Fractures from Roentgenologic Standpoint. S. B. Childs, Denver.—p. 390.
13 Roentgenoscopy of Foreign Bodies in Eye by Sweet Method. S. Derr, Atlanta, Ga.—p. 393.
14 Roentgenographic Examination of Urinary Bladder. J. M. Garratt, Buffalo.—p. 399.

Boston Medical and Surgical Journal

August 31, CLXXV, No. 9

15 *Contact Points Between Pulmonary Tuberculosis and Syphilis. J. A. Lyon, Rutland.—p. 285.
16 Tuberculosis Carriers. C. E. Perry, Northampton.—p. 292.
17 What Constitutes Clinical Tuberculosis in Adults? G. L. Schadt, Springfield.—p. 298.

15. **Contact Points Between Tuberculosis and Syphilis.**—Of 471 cases having received the Wassermann test, 430 were negative, 10 were doubtful, 2 were unsatisfactory, and 29, or 6 per cent., were positive. Of the 430 negative cases 140 had incipient pulmonary tuberculosis, 105 of these had repeated negative sputum, and 35 had positive sputum. Moderately advanced, 222, and of these 75 had negative sputum, and there were 149 instances where it was positive. The remaining 68 were far advanced; and of these 7 were negative, and 61 had positive sputum. The sputum was negative in 4, and positive in 2 of the doubtful cases in the incipient stage; 2 had negative and 2 had positive sputum in the moderately advanced stage. There were no doubtful cases in the far advanced stage of their pulmonary disease. Of 2 unsatisfactory cases, both of which were in the moderately advanced stage, one had a positive sputum and the other was negative. A positive Wassermann was obtained in 10 incipient cases, and of these cases 8 had negative sputum and 2 positive sputum. In the moderately advanced stage, 4 had negative and 11 positive sputum. In the far advanced stage there were only 4 that gave a positive Wassermann, and in each instance the sputum was positive. Lyon is firmly convinced that all patients who are suffering from diseases of the lungs should be given repeated Wassermann tests.

Bulletin of Johns Hopkins Hospital, Baltimore

September, XXVI, No. 307

18 *Localization of Cerebellar Tumors. Cranial Nerves. E. G. Grey, Boston.—p. 251.
19 Treatment of Emergency Cases of Ectopic Pregnancy. E. H. Richardson, Baltimore.—p. 262.
20 Etiology of Diseases of Circulatory System. T. C. Janeway, Baltimore.—p. 265.
21 Some of Professor Lexer's Work at Red Cross Auxiliary Naval Hospital, Veddel-Hamburg, Germany, 1914-1915. H. G. Beyer, U. S. Navy.—p. 267.
22 Superstition and Folklore of Menstruation. E. Novak, Baltimore.—p. 270.

18. **Localization of Cerebellar Tumors.**—Since anosmia in cases with intracranial tumor is usually a distant symptom due to a secondary internal hydrocephalus, Grey points out that it has no appreciable significance for the localization of the new growths. The sense of smell was affected in about 7 per cent. of the sixty-three certified cases analyzed in this report. Choked disk may have some importance when it is associated with other signs. It is Grey's experience that the early appearance and high degree of changes in the eye-grounds, when they appear in company with some of the so-called cerebellar symptoms, are important confirmatory evidence pointing toward a subtentorial localization of the new growth. The observations recorded by Grey are in favor of the view held by many that the nystagmus seen in cerebellar disease is very frequently of cerebellar origin—an asynergy of the eye muscles. When there is a definite and persisting difference in the size and rate of the jerks with the eyes in the lateral positions the nystagmus is usually suggestive of the side of the lesion. Conjugate deviation has relatively little importance for the localization of tumors within the posterior cranial fossa. A paresis or a paralysis of one facial nerve in tumors of the posterior cranial fossa is strong presumptive evidence of the side of the lesion, though a paresis appears not infrequently in median growths.

In subtentorial new growths a slight unilateral impairment of hearing, which has appeared for the first time in company with general pressure symptoms, is indicative either of a homolateral tumor or, less frequently, of a median growth. When hearing, under similar circumstances, is greatly impaired or lost in one ear, it points toward a homolateral extracerebellar localization of the tumor. Tinnitus is not a reliable guide to the side occupied by a tumor situated below the tentorium. Vertigo has no appreciable significance for the localization of the disease in one or another part of the posterior fossa. The presence of dysarthria and dysphagia (unless they are very marked) in patients with subtentorial tumors, though a source of anxiety, is no contraindication to operation, since neither is a reliable sign of an impending respiratory paralysis. When they occur, they constitute two of the most striking symptoms of intracerebellar and extracerebellar new growths.

Canadian Medical Association Journal, Toronto

August, VI, No. 8

23 Treatment of Diabetes Mellitus. E. P. Joslin, Boston.—p. 673.
24 Colloidal Gold Test in Cerebrospinal Fluids. G. A. Ramsay and E. Fidlar, London.—p. 685.
25 Medical Work at Base Hospital in France. F. G. Finley.—p. 692.
26 Meningococcus Meningitis. J. G. Fitzgerald, Toronto.—p. 695.
27 Definite Treatment of Pneumonia; Report of Germicidal Power of Quinin and Other Cinchona Derivatives on Pneumococcus Cultures in Vitro. S. S. Cohen, Philadelphia.—p. 706.
28 Transthoracic Operation for Chronic Empyema and for Bronchiectasis. F. N. G. Starr.—p. 713.
29 Blood Transfusion in Hemorrhage of Newborn. A. Brown, Toronto.—p. 716.

Cleveland Medical Journal

July, XV, No. 7

30 Typhoid in Cleveland in 1915. J. G. Frey and R. G. Perkins, Cleveland.—p. 443.
31 Goiter Problem. H. G. Sloan, Cleveland.—p. 453.
32 Regional Hypertonus. L. Taylor, Cleveland.—p. 468.
33 Recent Advances in Gynecology and Obstetrics. W. D. Fullerton, Cleveland.—p. 475.
34 Neurologic Reviews. T. S. Keyser, Cleveland.—p. 479.
35 Clinical Laboratory Methods. C. L. Cummer, Cleveland.—p. 482.

Delaware State Medical Journal, Wilmington

May, VII, No. 6

36 Double Shame of Baltimore. Her Unpublished Vice Report, Her Indifference. H. A. Kelly, Baltimore.—p. 2.
37 Under Cover of Respectability. (To be continued.) W. D. Lane, Wilmington.—p. 5.

June, No. 7

38 Under Cover of Respectability. W. D. Lane, Wilmington.—p. 7.

Indiana State Medical Association Journal, Fort Wayne

August, IX, No. 8

39 *Benzol in Treatment of Leukemia. J. M. Barry and J. M. Ketcham, Indianapolis.—p. 315.
40 Some Later Methods Used in Diagnosis and Treatment of Sterility. P. E. McCown, Indianapolis.—p. 323.
41 Bacteriologic Study of Recent Epidemic of Infection of Respiratory Tract. V. H. Moon and S. C. Summers, Indianapolis.—p. 327.
42 Some Considerations in Pelvic Floor Work in Women. W. H. Baker, South Bend.—p. 329.

39. **Benzol in Treatment of Leukemia.**—From a study of the literature and from their experience with one case, the authors believe they are justified in concluding that benzol has a wonderfully selective action in chronic myeloid leukemia, if uncomplicated and not of too long duration; that one can count with considerable assurance on getting a rapid reduction in the number of leukocytes; on getting a normal, or nearly normal, blood formula; a rapid diminution in the size of the spleen; an increase in the red cell count and the hemoglobin; and a concomitant improvement in the general health of the patient, increase in weight, etc. One should never forget, however, that the drug is a powerful poison, a two-edged sword, and not carry its effects too far, thus completely destroying the function of the bone marrow and substituting a grave aplastic anemia for the leukemia. The patient ought to be in a hospital, in bed; the gastro-intestinal tract, kidneys and liver be watched carefully for toxic symptoms; blood counts should be made every few days; the benzol should not be increased in dosage without definite warrant, and its administration should be stopped entirely considerably before the white count has returned to normal. With these precautions there should be no grave results.

Iowa State Medical Society Journal, Des Moines

August, VI, No. 8

43 Cardiac Pain. A. Lambert, New York.—p. 337.
44 Tumors of Hypophysis Cerebri; Report of Case. C. E. Ruth, Des Moines.—p. 343.
45 Problems of Surgical Judgment Associated with Treatment of Gastric and Duodenal Ulcers. E. MacD. Stanton, Schenectady, N. Y.—p. 350.
46 Epidemiology of Poliomyelitis. M. F. Boyd, Iowa City.—p. 356.
47 Practical Diagnosis and Treatment of Benign Tumors of Bladder. E. J. Harnagel, Des Moines.—p. 361.
48 Pneumonia in Children. C. W. Rominger, Waukon.—p. 363.

Journal of Experimental Medicine, Baltimore

September, XXIV, No. 3

49 Non-Gas Producing Strain of Hog-Cholera Bacillus Isolated from an Old Laboratory Culture. C. Tenbroeck, Princeton, N. J.—p. 213.
50 *Effects of Exposure to Cold on Experimental Infection of Respiratory Tract. J. A. Miller and W. C. Noble, New York.—p. 223.
51 Studies on Heterogeneous Hemolytic Serums. I. L. Kritchevsky, Moscow, Russia.—p. 233.
52 Effects of Serum Treated with Agar. E. Zunz and M. Gelat, Lausanne, Switzerland.—p. 247.
53 *Experimental Study of Circumscribed Dilatation of Artery Immediately Distal to Partially Occluding Band, Its Bearing on Dilatation of Subclavian Artery Observed in Certain Cases of Cervical Rib. W. S. Halsted, Baltimore.—p. 271.
54 Distortion of Malarial Parasite. Interpretation of "Plasmodium Tenue" (Stephens). M. R. Lawson, New London.—p. 291.
55 Partial Occlusion of Aorta with Metallic Band. Observations on Blood Pressures and Changes in Arterial Walls. M. R. Reid, Baltimore.—p. 287.

50. **Exposure to Cold in Respiratory Infection.**—The organism chosen by Miller and Noble for inoculation was *Bacillus boviscepticus*, or snuffles bacillus, which belongs to the hemorrhagic septicemia group and is pathogenic for the rabbit. They found that respiratory infection is favored by chilling the animals after they have been accustomed to heat. It is suggested that any marked change of temperature predisposes to this infection, the severity of which varies with the amount of change, and that change from low to high temperature has an even more marked effect than that from high to low.

53. **Circumscribed Dilatation of Artery.**—Halsted's experiments showed that a partially occluded artery may dilate distal to the site of constriction. The dilatation is circumscribed. When the constriction has been either slight in amount or complete, dilatation has not been observed. The dilatation was greatest when the lumen of the artery (the aorta) was reduced to one third or perhaps one fourth of its original size. Dilatation or aneurysm of the subclavian artery has been observed twenty-seven or more times in cases of cervical rib. The dilatation of the subclavian is circumscribed, is distal to the point of constriction, and strikingly resembles the dilatation which Halsted produced experimentally. The genesis of the experimental dilatation and of the subclavian dilatation occurring with cervical rib is probably the same. The experimentally produced dilatations and the aneurysms of the subclavian artery in cases of cervical rib are probably not due to vasomotor paralysis, trauma, or sudden variations in blood pressure. Halsted suggests that the abnormal, whirlpool-like play of the blood in the relatively dead pocket just below the site of the constriction, and the lowered pulse pressure may be the chief factors concerned in the production of the dilatations. Intimal surfaces brought, however gently, in contact by bands or ligatures do not, in his experience, unite by first intention, for the force necessary to occlude the artery is sufficient to cause necrosis of the arterial wall. Bands, rolled ever so tightly, do not rupture the intima. The death of the arterial wall having been brought about by the pressure of the band, a gradual substitution of the necrotic tissue takes place, the new vessels penetrating it from both ends.

Journal of Laboratory and Clinical Medicine, St. Louis

June, I, No. 9

56 Poisonous Proteins. (To be continued.) V. C. Vaughan, Ann Arbor, Mich.—p. 631.
57 *Pharmacologic Action of Nitrous Oxid. D. E. Jackson, St. Louis.—p. 644.
58 *Cholesterin Retention as Factor in Cell Proliferation. C. Rosenow, Rochester, Minn.—p. 662.
59 Present Status of Tuberculosis Chemotherapy. L. M. Hewitt, Chicago.—p. 677.
60 Sugar Content of Cerebrospinal Fluid in Health and Disease. W. M. Kraus and G. G. Corneille, New York.—p. 685.
61 Artificial Respiration Apparatus for General Laboratory Purposes. P. J. Hanzlik, Cleveland.—p. 688.
62 Color Reactions of Proteins and Their Split Products. H. W. Emerson and J. S. Chambers, Ann Arbor, Mich.—p. 692.
63 Physical Characteristics of Spinal Fluid in Various Diseases. A. Levinson, Chicago.—p. 699.
64 Delayed Negative Wassermann Reaction. G. M. Olson, Minneapolis.—p. 704.

57. **Pharmacologic Action of Nitrous Oxid.**—The thought has occurred to Jackson that nitrous oxid might be used as a hypnotic. He has tried repeatedly to compare the mild on-coming effects of the gas as breathed with a considerable proportion of oxygen with the physical and mental sensations present as one begins to fall asleep. There is a very striking similarity, a marked feeling of tiredness and exhaustion, the limbs feel heavy and the eyelids tend to close. One's mentality gradually sinks and there is difficulty in maintaining connected thought. The natural inclination of the subject of the experiment is to lie down quietly and fall asleep. The sensations remind one of the feelings of a child worn out by a long day's play when it lies down at night to sleep. Sometimes Jackson has noted slight muscular twitchings or feeble jumping or convulsive moments. These, he thinks, would probably not occur if the gas were administered very slowly with plenty of oxygen and a sufficiently long period of time

were used to bring on the action of the drug. Suggestion appears to play a noticeable part in this action, for if one keeps perfectly quiet and at rest and tries to go to sleep, then the somnolent action of the gas is especially liable to be well marked. It would appear that this matter of suggestion extends even to dogs. For an animal which is petted and induced to lie down quietly and at complete rest may very often take the gas readily and peacefully fall asleep.

58. **Cholesterin Retention as Factor in Cell Proliferation.**—Proceeding on the working hypothesis that essential factors for the effectual progress of malignant proliferation are: (1) the creation of a disturbance of metabolism which would lead to an accumulation of cholesterin, (2) an extraneous irritant, and (3) the breaking down of the "lymphoid defence." Luden began in March, 1915, to give light treatment by Roentgen rays to a double suprarenalectomized spermophile (citellus tridecemlineatus). The results obtained were a marked change in the blood picture, there being an increase of normoblasts from 0 to 10 per cent. in the course of six months, and the appearance of pathologic, "unripe" leukocytes together with proliferation in various tissues. The experiment was then repeated on eight spermophiles; two were double and suprarenalectomized, three were double ovariectomized and three were used as normal controls. The results already described were found to repeat themselves both in blood and tissue. The proliferation of the various types of tissues is comparable to the proliferation of the small arteries in lungs and kidneys together with changes in the spleen resembling those found in "Gaucher's spleen," which have been observed after forced cholesterin feeding.

Luden has studied simultaneously in goats the effect of cholesterin feeding alone, the influence of the Roentgen rays alone, and the influence of cholesterin feeding combined with Roentgen treatment. Here also similar changes in the blood picture were observed. Recently Luden made a series of observations on the cholesterin content of the blood of patients suffering from malignant disease. The normal cholesterin value as given by Authenrieth and Bloor averages about 0.18 with a low limit of 0.14 per cent. The high normal value has not yet been determined, but Luden found it as high as 0.27 per cent. in apparently normal adults. The cholesterin content of the blood of the patients studied varied from 0.254 to 0.71 per cent., the average being 0.449. The patient having the highest cholesterin value of all showed not only symptoms of proliferation in the blood (109 normoblasts, fourteen megaloblasts in a count of 300 cells; a picture typical of pernicious anemia according to Ehrlich; atypical according to Grawitz) but malignant degeneration in a number of histologically diverse tissues as well. Luden is convinced that the retention of cholesterin due to its insufficient conversion or defective elimination may be a primary factor in the etiology of malignant disease.

Kansas Medical Society Journal, Topeka

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66 Acute Torsion of Spermatic Cord, Symptoms of Which Resemble Strangulated Omental Hernia. H. L. Snyder, Winfield.—p. 195.
67 Hospital Hints. J. T. Axtell, Newton.—p. 199.
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Laryngoscope, St. Louis

August, XXVI, No. 8

69 Diagnosis and Treatment of Syphilitic Affections of Acoustic Nerve, with Special Reference to Use of Salvarsan. G. E. Davis, New York.—p. 1065.
70 Study of Tumors of Uvula—Considering Their Frequency, Malignancy and Recurrence; Report of One Additional Papilloma (Exclusive of Angioma). P. S. Stout, Philadelphia.—p. 1075.
71 Brain Abscess from Chronic Suppuration in Frontal Sinus; Report of Case. T. P. Berens, New York.—p. 1083.
72 Simple Method of Fixation of Intubation Tubes. S. Iglauer, Cincinnati.—p. 1089.
73 Acidosis; Its Importance in Nose and Throat Surgery in Children. W. H. Johnston, Muscatine, Iowa.—p. 1093.
74 Infections of Ears, Nose and Throat as Primary Foci for Secondary Infections. C. G. Crane, Brooklyn.—p. 1099.
75 Connecting Links Between Endocrinology (Internal Secretions) and Otorhinology. H. R. Harrower, Los Angeles.—p. 1105.

New York State Journal of Medicine

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76 Value and Limitations of Physiologic Therapeutics. J. M. Swan, Rochester.—p. 379.
77 Treatment of Anterior Poliomyelitis. C. Wallace, New York.—p. 386.
78 Epidemic Poliomyelitis. F. E. Froncz k, Buffalo.—p. 389.
79 Experience in Epidemic of Poliomyelitis. J. Roby, Rochester.—p. 393.
80 *Practical Aspects of Ovarian Secretions. W. P. Graves, Boston.—p. 394.
81 Diagnosis of Inflammatory Diseases of Labyrinth. J. B. Rae, New York.—p. 401.
82 Treatment of Labyrinthine Affections. W. C. Phillips, New York.—p. 404.
83 Fundamental Causes, Prevention and Principles of Treatment in Acute Membrane Inflammations, with Special Reference to Inflammations of Ear, Nose and Throat. S. F. Snow, Syracuse.—p. 409.
84 Recent Studies in Diabetes Mellitus. J. R. Williams, Rochester.—p. 412.
85 Pelvic Inflammation. R. Burns, Syracuse.—p. 418.
86 Fatality of Chickenpox, Mumps and German Measles. L. R. Williams, Albany.—p. 422.

80. Abstracted in THE JOURNAL, June 24, p. 2124.

Pennsylvania Medical Journal, Athens

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87 Bronchiectasis and Bronchiectatic Symptoms Due to Foreign Bodies. C. Jackson, Pittsburgh.—p. 807.
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89 Technic of Injecting Gasserian Ganglion with Alcohol for Tic Douloureux. G. M. Dorrance, Philadelphia.—p. 814.
90 Gestation Complicated by Appendicitis. S. E. Tracy, Philadelphia.—p. 826.
91 General Practitioner's Experience with Pituitary Extract. M. C. Rumbaugh, Kingston.—p. 829.
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93 Recent Conceptions of Some Throat Infections. J. A. Hagemann, Pittsburgh.—p. 836.
94 Few Significant Points in Hypertension and Hypotension Blood Pressure. R. D. Snively, Philadelphia.—p. 838.
95 Medical Preparedness. F. L. Van Sickle, Olyphant.—p. 839.
96 Two Cases of Anal Herpes Zoster. L. H. Adler, Jr., Philadelphia.—p. 842.
97 Significance of Abdominal Pain. J. B. Deaver, Philadelphia.—p. 843.
98 Visions (Not Optical). C. G. Brumbaugh, Huntington.—p. 846.
99 Looking Forward in Medical Profession. J. B. McAlister, Harrisburg.—p. 848.
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Public Health Journal, Toronto

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102 Poliomyelitis (Infantile Paralysis). W. H. Frost, Cincinnati.—p. 371.
103 Care of Children Under School Age. D. Forsyth.—p. 381.
104 Flies and Refuse Heaps. W. H. Symons, Bath, N. B.

South Carolina Medical Association Journal, Greenville

August, XII, No. 8

105 Noninflammatory Pneumohematoma Simulating Hernia, Following Transverse Suprapubic Abdominal Section. L. Peters, Columbia.—p. 229.
106 Montgomery Operation in Uterine Retrodisplacements. S. O. Black, and H. S. Black, Spartanburg.—p. 232.
107 Use and Abuse of Uterine Curet. G. Bunch, Columbia.—p. 233.

Surgery, Gynecology and Obstetrics, Chicago

September, XXIII, No. 3

108 *Extended Operation for Carcinoma of Uterus. R. Peterson, Ann Arbor, Mich.—p. 237.
109 Roentgen Therapy of Uterine Hemorrhage. R. T. Frank, New York.—p. 243.
110 *Precancerous Changes in Uterus. W. S. Stone, New York.—p. 248.
111 *Detailed Study of Pathologic Causes of Sterility with End Results. J. O. Polak, Brooklyn.—p. 261.
112 *Syphilis of Body of Uterus; Report of Case. C. C. Norris, Philadelphia.—p. 268.
113 *Syphilitic Fever in Relation to Gynecologic and Obstetric Practices. F. J. Taussig, St. Louis.—p. 274.
114 *Occurrence of Syphilis in University of Michigan Obstetric and Gynecologic Clinic. R. Peterson, Ann Arbor, Mich.—p. 280.
115 Specificity of Wassermann Reaction. R. Buhman, St. Louis.—p. 284.
116 *High Degrees of Heat vs. Low Degrees of Heat in Treatment of Cancer of Uterus. H. J. Boldt, New York.—p. 288.

117 Past, Present and Future of Gynecology, Obstetrics and Abdominal Surgery. J. W. Bovée, Washington, D. C.—p. 290.
118 Epiploitis Following Herniotomy. W. Hessert, Chicago.—p. 297.
119 *Transplantation of Articular End of Bone Including Epiphyseal Cartilage Line. S. L. Haas, San Francisco.—p. 301.
120 Traumas of Back and Spine; Report of Cases. F. E. Pierce, Chicago.—p. 332.
121 Abdominal Pregnancy; Report of Case. B. Solomons, Dublin.—p. 338.
122 Rhabdomyoma of Prostate; Report of Case. J. B. Squier, New York.—p. 341.
123 Eventration of Diaphragm and Dextrocardia; Report of Case. H. G. Wood, Galesburg.—p. 344.
124 Ganglioneuroma; Report of Case. R. J. Behan, Pittsburgh.—p. 348.
125 Application of Bone Graft in Treatment of Partial or Complete Avulsion of Adolescent Tibial Tubercle (Schatter's Disease). R. E. Soule, New York.—p. 353.
126 Cylindroma of Tongue; Report of Two Cases. R. H. Baker, Ann Arbor, Mich.—p. 356.
127 Fluoroscopic Roentgen Injection of Bladder. E. H. Skinner, Kansas City, Mo.—p. 361.
128 *Unusual Hydrocele Content. J. Eduque, Manila.—p. 362.
129 Modified Purse String Bladder Suture. A. H. Peacock, Seattle, Wash.—p. 364.
130 Pituitary Extract in Post Abortion Curetment. H. D. Furniss, New York.—p. 365.

108. Abstracted in The Journal, June 3, p. 1818.

110. **Precancerous Changes in Uterus.**—It seems to Stone that the evidence in the literature and the material which he presents justifies the conclusion that as the positive identification of a malignant neoplasm cannot be made histologically until definite destructive capacity is recognized it seems reasonable to relate more definitely the other histologic criteria of cancer to the developmental stage of its growth. In the study of uterine pathology there are seen numerous morphologic alterations of epithelial growth which differ but little from the regenerative activity of benign lesions, but which after a longer or shorter time show features that are differentiated with difficulty from malignant neoplasm. The strongest support of this assumption is derived from the reproduction of types which are seen in the different stages of their progress. There are the atypical features of a healing erosion, for example, determined by the original type of the primary erosion—simple, papillary, follicular; and we find the atypical types again reproduced in the different types of fully established uterine cancer. In Stone's cases there are atypical healing erosions which are prototypes of either an epidermoid cancer or a papillary adenocarcinoma. There are leukoplacias which are prototypes of adult acanthomata. There are glandular hyperplasias which lead to adenoma or adenocarcinoma. Finally, there are focal areas of leukoplakia, combined with adenomatous hyperplasia, which may well furnish an origin for tumors designated as adenoacanthomata. In short, for each type of fully developed carcinoma there is a corresponding type of benign and intermediary change. The decision regarding the proper therapeutic procedure in these cases should be assumed by a competent clinician.

111. Abstracted in The Journal, June 17, p. 2033.

112. **Syphilis of Body and Uterus.**—In the case cited by Norris the changes were typical of those produced by syphilis elsewhere in the body. The patient contracted syphilis six years ago, antisyphilitic treatment was discontinued nine months ago. Menorrhagia and other symptoms of syphilis of the body of the uterus developed three months later. The Wassermann test was at this time strongly positive. The chief clinical symptom was the menorrhagia and the chief pathologic lesion the great softening and friability of the uterus together with the more typical changes usually produced by syphilis.

113. Abstracted in The Journal, June 3, p. 1818.

114. **Syphilis — University of Michigan Clinic.**—Out of 2,000 inpatients in the University Hospital excluding two services the proportion of syphilitics was 6 per cent. The percentage of syphilis in 381 cases in the University Maternity was 4.7 as shown by the Wassermann reactions and expert physical examinations. In eighteen cases of syphilis among the number examined only eight gave a history of syphilis. In only the same number (eight) were there positive physical signs of syphilis. As shown by the histories of the eighteen cases there is a greater chance of the syphilitic mother treated by salvarsan and mercury to give birth to a living, full-term child than where no treatment be given during pregnancy. Out of 390 gynecologic patients subjected to the Wassermann test, twenty-two, or 5.6 per cent., gave positive reactions. In only five of the twenty-two syphilitic patients was there a history of syphilis.

116. Abstracted in The Journal, June 17, p. 2033.

119. **Transplantation of Articular End of Bone.**—The material for Haas' report was obtained from seventy-five experiments on dogs, mostly in the early growing period. He found that the epiphyseal cartilage line ceases to functionate after reimplantation and autotransplantation, either when transplanted by itself or with a small or a large piece of adjoining diaphyseal or epiphyseal bone, or even when transplanted as an entire intact bone. The longitudinal growth ceases in every case. The articular cartilage undergoes practically no changes after reimplantation. In autotransplantation there occurs at times evidence of degenerative and regenerative changes. The marrow of the transplant appears to undergo an early complete necrosis. The trabeculae show early evidence of degeneration as is indicated by the loss of staining property of the nuclei. The cortex shows an early loss of nuclear staining. Following the first operation in the two-stage autotransplantation of the epiphyseal end of a bone, there is a considerable disturbance in the function of the epiphyseal cartilage line, even though the epiphysis is not separated from the surrounding tissue.

The vitality of the various components of bone after transplantation is directly related to the ability of that part to withstand the loss of its vascular supply. From these experiments and the results in general on transplanted bone the following conclusion is offered regarding the fate of bone after transplantation. Although each part of transplanted bone possesses the power to regenerate independently and without the aid of neighboring bone, this autonomous newly formed tissue does not possess that property which is necessary for a continued existence, and it will ultimately entirely disappear. Some additional stimulus is needed and such conditions are only obtained when the transplant is in direct contact with normal growing bone. It is possible that certain chemical or physiologic stimuli are supplied by the living intact bone, after which the regenerated bone on account of these additional factors is able to persist permanently. Undoubtedly some definite osseous elements from the bone of the host invade the transplant and either replace the temporary bone or give to it certain requisites for its perpetuation. Although function may play a factor in the development of bone it is not of prime importance in determining the permanency of that tissue. Haas is convinced that the differences of opinions of the various investigators is in part due to the failure to allow sufficient time to elapse before drawing final conclusions, as well as to take into account the influence of different environmental conditions on the transplant from both young and old animals.

128. **Unusual Hydrocele Content.**—When Eduque operated on his patient a sac was encountered in the scrotum, containing the stomach, cecum, about 6 feet of jejunum and duodenum all plastered together. During manipulation one loop of intestine was incised. This was sutured with linen. The appendix was found to be big and long and bound to the posterior surface of the cecum by adhesions.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

August, XXI, No. 3

1 Roentgenography of Bronchial Lymph Nodes. W. Overend and C. Riviere.—p. 73.
2 Renal Calculi; Report of Case. C. T. Holland.—p. 83.

Brain, London

June, XXXIX, Parts, 1 and 2

3 Electric Reactions of Muscles Before and After Nerve Injury. E. D. Adrian.—p. 1.

4 *Disturbances of Vision From Cerebral Lesions, With Special Reference to Cortical Representation of Macula. G. Holmes and W. T. Lister.—p. 34.
5 *New Familial Infantile Form of Diffuse Brain Sclerosis. K. Krabbe. —p. 74.
6 Acute Poliomyelitis. F. E. Batten.—p. 115.

4. Disturbances of Vision from Cerebral Lesions.—According to Holmes and Lister the upper half of each retina is represented in the dorsal, and the lower in the ventral part of each visual area. The center for macular of central vision lies in the posterior extremities of the visual areas, probably on the margins and the lateral surfaces of the occipital poles. That portion of each upper quadrant of the retina in the immediate neighborhood of, and including the adjacent part of, the fovea centralis is represented in the upper and posterior part of the visual area in the hemisphere of the same side, and vice versa. The center for vision subserved by the periphery of the retina is probably situated in the anterior end of the visual area, and the serial concentric zones of the retina from the macula to the periphery are probably represented in this order from behind forward in the visual area.

5. **New Infantile Form of Diffuse Brain Sclerosis.**—The so-called diffuse sclerosis of the brain in children are divided by Krabbe into at least three quite distinct types: (1) A syphilitic form; (2) Schilder's encephalitis periaxialis diffusa; (3) a familial infantile form, of which five cases are discussed in this paper; the literature probably contains one other case. This form shows the following characteristics; it is usually a familial disease; it sets in somewhat acutely in about the fifth month in a child who up to then has been quite healthy; it progresses on a chronic course, ending with death, five to six months after the onset; universal rigidity of the musculature, violent tonic spasms, probably causing pain, and brought on by touching or noise form characteristic symptoms. As a rule, nystagmus is present, and in the latter stages atrophy of the optic nerve. Periodic elevations of temperature occur without perceptible cause, outside the central nervous system. Finally, extensive paresis and pronounced debility close the scene.

The pathologic anatomic findings are: A marked hardness of the white substance of the brain without alteration of its shape. Microscopic examination of three cases showed relative intactness of cortex and the basal ganglia, the nervous centers of the brain and of the spinal cord; destruction of the medullary sheaths and axis cylinders throughout the white substance of the cerebrum (a 2 mm. layer, however, is preserved immediately under the cortex). Complete destruction of the white matter of the cerebellum and degeneration of the spinal nerve tracts are present. The destroyed tissue is replaced by dense fibrillar glia, in which are seen a considerable number of variously shaped glia cells, mostly protoplasmic; the vessel sheaths are infiltrated with fatty granule cells and other apparently gliogenous scavenger cells. There is a total want of new formation of vessels or infiltration of the vessel sheaths with plasma cells, lymphocytes or leukocytes. Krabbe is of the opinion that the affection must be regarded as a purely degenerative and not as an inflammatory process. The disease presents a certain relationship to Pelizaeus-Merzbacher's disease, aplasia axialis extracorticalis congenita, on one side, and to Tay-Sachs' form of familial amaurotic idiocy on the other side. In other respects, however, it differs conspicuously from both these groups.

British Journal of Children's Diseases, London

August, XIII, No. 152

7 Congenital and Acquired Sclerodermia in Childhood. E. A. Cockayne.—p. 225.
8 Case of Hemihypertrophy with Postmortem Examination. R. Hutchison.—p. 233.
9 Gangrene of Leg Following Diphtheria. E. B. Gunson.—p. 237.

British Medical Journal, London

August 12, II, No. 2902

10 Contractures of Hand After Wounds of Upper Limb. W. M. Macdonald.—p. 209.
11 Distant Effects of Rifle Bullets; With Special Reference to Spinal Cord. J. S. Bury.—p. 212.
12 Treatment of Gunshot Fractures. D. M. Aitken.—p. 213.
13 Treatment of Convalescent Soldiers by Physical Means. R. T. McKenzie.—p. 215.
14 Trismus During Serum (Antistreptococcus) Sickness (Septic Finger). R. F. Bolt.—p. 218.
15 Babinski's Sign From Point of View of Comparative Anatomy. M. Astwazaturof.—p. 219.

August 19, No. 2903

16 Injuries of Bladder and Urethra in War. A. Fullerton.—p. 245.
17 *Case of Cyst of Intestine. C. Bolton and T. W. P. Lawrence. —p. 248.
18 *Three Cases of Gastroptosis Treated by Gastropexy (Rovsing). M. Connon.—p. 250.
19 *Perforation of Gastric Ulcer Occurring in Sac of Large Congenital Diaphragmatic Hernia. L. Gordon.—p. 250.
20 Injuries and Destructive Effects of Aeroplane Bombs. H. V. Wells and H. G. Anderson.—p. 252.
21 *Appliance for Use in Severe Injuries of Upper Extremity. G. Arnold.—p. 254.
22 Simple Method of Repairing Defects of Scalp. C. Wallace. —p. 256.
23 *Simple Method of Putting Up Fractures in Region of Elbow Joint in Fully Flexed Position. L. C. Rivett.—p. 256.

17. Cyst of Intestine.—The patient whose case is reported by Bolton and Lawrence was a baby 3 months old. The child was born at full term, and was breast-fed till the age of 5 weeks. From birth it vomited a little after its feeds, the milk being returned unchanged. At the end of five weeks, this symptom becoming worse, the child was weaned and various kinds of foods administered without any relief to the vomiting. Wasting supervened after the first week. The bowels were from birth very constipated, being opened about once in four days until the end of the fourth week, when eight days elapsed on one occasion without an action occurring. The child died about two weeks after she was first seen by the authors. A necropsy was performed. Adhering to the terminal part of the ileum was a cyst, measuring 3 cm. by 2.5 cm., ovoidal in shape, with its long axis parallel with that of the bowel. The cyst lay on the mesenteric aspect of the ileum, between the layers of the mesentery, its cavity having no communication with the lumen of the intestine. The terminal portion of the ileum, as it coursed over the cyst, was flattened against the convex surface of the latter and stretched transversely; consequently the lumen of the bowel was linear in transverse section, and its opposed walls were held in contact firmly. The cyst extended slightly beyond the lower limits of the ileum, its lower pole causing a low convex projection of the wall of the cecum just beyond the ileocecal valve.

18. Gastroptosis Treated by Gastropexy.—The three cases detailed by Connon seem worthy of being placed on record for the following reasons: The patients were the subjects of well marked gastroptosis, but (1) were males; (2) they were not neurasthenics; (3) occupation appeared to be a predisposing factor in the causation of their complaint. They were all workmen who, over long periods, had, from the nature of their daily employment, to lift heavy weights, a considerable amount of strain being thereby put on their abdominal muscles and viscera; (4) great benefit has accrued from the operations, as reported in one case after three years and in another one year. The third case is comparatively recent.

19. Perforation of Gastric Ulcer.—Few reported cases of congenital diaphragmatic hernia have been diagnosed during life. A sign which in Gordon's case was of interest and which may be of some diagnostic value was the peculiar attitude the patient adopted. He stood, or sat up in bed, with the body bent well forward and the knees bent. He refused to lie down, stating that the pain was increased when he tried to do so. The attitude appeared to be one which most relieved the tension of the diaphragm.

21. Appliance for Use in Injuries of Arm.—Arnold employed a rectangular plate about 45 by 38 cm., usually a plate of perforated aluminum 4 to 5 mm. in thickness. This plate, splint, tray, or supporting appliance can be fashioned from other material than aluminum, provided the material selected is nonabsorbent, readily cleaned, sufficiently rigid as not to bend in use, and light in weight. One corner of the splint is fitted close into the axilla, and here the upper arm is secured to the plate by means of a fold of gauze passing through holes in the plate on either side of the limb just

below the shoulder. Extension is obtained in part by the weight of the limb below the fracture, but is assisted by the tension of the pad and band at the bend of the elbow, which secures the arm to the lower posterior corner of the support.

A cushion in the axilla is interposed between the splint and the thorax, the cushion being kept in position by attachments which pass over the opposite shoulder. The plate and limb together are well slung up and in the early stages of very severe injuries the patient should be in bed with the splint in an inclined position resting on a firm pillow. If there is a wound on the surface of the limb toward the plate the latter should be fenestrated at the corresponding area in order to allow the necessary frequent dressings to be done without removing the injured member from its supporting splint. In the case of fractures of the forearm with shortening and displacement of the fragments, the splint is applied in the way already described, but extension and counter extension will be required, and the splint affords an efficient and easy means for this. This splint, it is said, affords a very complete degree of rest to the entire musculature of the upper extremity, and that without being burdensome by any exaggerated restraint imposed, for while it provides very perfect immobilization, it opposes little restriction to movements of other parts of the body.

23. **Fractures of Elbow Joint Put Up in Fully Flexed Position.**—Two strips of adhesive plaster are required with Rivett's method each about 1 foot long and from 1½ to 2 inches wide. The first strip is used to maintain the forearm fully flexed on the upper arm. It is so placed as to encircle the arm and forearm just below the fold of the axilla, and immediately above the wrist. It should be sufficiently long to overlap about 1 inch, and, if applied direct to the skin, it will not tend to slip down in the direction of the elbow. The second strip is used to support the arm and hand, and is applied to the back of the forearm and hand, extending only as far as the first strip. The other end is then placed over the same shoulder and fixed to the back.

Lancet, London

August 19, II, No. 4851

24 Rivers as Sources of Water Supply. A. C. Houston.—p. 311.
25 *Effect of Addition of Fresh Human Blood Serum to Artificial Media. L. S. Dudgeon, F. Bawtree and D. Corbett.—p. 314.
26 *Three Cases of Entameba Histolytica Infection Treated with Emetin Bismuth Iodid. G. C. Low and C. Dobell.—p. 319.
27 *Intravenous Injection of Oxygen Gas as Therapeutic Measure. F. W. Tunnicliffe and G. F. Stebbing.—p. 321.
28 *Gluteal Fold in Sciatic Neuritis. H. Carlill.—p. 323.
29 Case of Dilatation of Hepatic Flexure of Colon. W. J. Morrish —p. 325.
30 Shiah Pilgrimage and Sanitary Defences of Mesopotamia and Turco-Persian Frontier. F. G. Clemow.—p. 333.

25. **Human Serum and Artificial Media.**—The addition of normal fresh human blood serum to artificial media in the culture of micro-organisms according to Dudgeon and his associates has the following effects: It provides a most favorable medium for growth in cases in which culture under artificial conditions may otherwise fail. It greatly increases the amount of growth in those media to which it has been added compared to those prepared without it. It stimulates the growth of pathogenic organisms as opposed to non-pathogenic. It prolongs the life of organisms which are prone to die out under artificial conditions as shown in the case of the meningococcus. It greatly facilitates the culture of the diphtheria bacillus, and in its combination with different media helps to illustrate all aspects of the morphology of this organism. It exercises considerable influence on other organisms of variable morphology tending in the case of the pneumococci to reproduce the true type as found in the body fluids. It profoundly alters the fermentation reactions of the streptococci and pneumococci, tending to obliterate the finer differences between types or the differences due to particular environment.

26. **Entameba Histolytica Infection Treated with Emetin Bismuth Iodid.**—Clinical experience has convinced Low and Dobell that emetin bismuth iodid is far more efficacious than emetin hydrochlorid, given hypodermically, in removing the cysts from the feces of chronic carriers. So far the drug has been given in a single dose of 3 grains, this representing a little more than 1 grain of emetin—once a day in the evenings with the last meal, for five days and never on an empty stomach, as was customary with ipecacuanha.

27. **Intravenous Injection of Oxygen.**—The result of Tunnicliffe and Stebbing's observations is that oxygen gas can be introduced into the veins in quantities from 500 to 1,000 c.c. at the rate of from 600 to 1,200 c.c. per hour. Cyanosis and the dyspnea attending it are rapidly relieved; the rate usually begun with is 500 c.c. per hour. The more cyanosed the patient, the better is a rapid rate tolerated. As the cyanosis is reduced the rate should be diminished. During the administration the pulse should be watched and the heart auscultated frequently. Irregularity in a previously regular pulse or increased irregularity in a previously irregular pulse is an indication to cease the injection. This phenomenon is preceded by a soft systolic murmur heard over the area of the tricuspid valve, and this murmur should be listened for. The best method is to inject the gas for periods of from ten to fifteen minutes with pauses of two or three minutes between, injecting during these pauses just enough gas to prevent clotting in the cannula. The ideal case for reaping benefit from this treatment is one in which the cyanosis and dyspnea are due to acute respiratory difficulty and in which the heart is fairly healthy. The object of this preliminary note is not to indicate the specific pathologic conditions in which the intravenous injection of oxygen should be used, but simply to point out that in those cases in which the inhalation of oxygen either cannot be practiced or gives inadequate relief, the intravenous method of oxygen administration, if carefully carried out, is available and will give therapeutic results.

28. **Gluteal Fold in Sciatic Neuritis.**—Carlill calls attention to a fact in the diagnosis of sciatic neuritis. It is that the gluteal fold may be very poorly developed in this condition. Commonly it is absent altogether, and this may be the case whether the affection is unilateral, bilateral, or part of a multiple peripheral neuritis.

Medical Journal of Australia, Sydney

July 15, II, No. 3

31 Undiagnosed Dislocations. J. G. Edwards.—p. 35.
32 Headache From Otorhinologist's Point of View. W. N. Robertson. —p. 38.

July 22, No. 4

33 Asthma; Its Cause and Treatment. W. W. Ewbank.—p. 51.
34 Treatment of Eclampsia. J. Harris.—p. 55.
35 Tumbling Cubes. I. Silverman.—p. 56.

July 29, No. 5

36 Genito-Urinary Cases; Treatment of Ureteral Fistula Following Ureterolithotomy; Extensive Ureterocele with Vesical Calculus; Two Stage Prostatectomy; Bilateral Renal Decapsulation for Post Eclamptic Suppression of Urine, with Recovery; Nephrectomy for Hypernephroma. S. H. Harris.—p. 69.

Quarterly Journal of Medicine, London

July, IX, No. 36

37 *Penetrating Wounds of Lung and Pleura; Report of Cases. R. D. Rudolf.—p. 257.
38 Researches on Perfused Heart. Some Factors of Cardiac Mechanism Illustrated by Reference to Certain Actions of Barium and Digitalis. W. Burridge.—p. 271.
39 Thrombo-Angeitis Obliterans (Nonsyphilitic Arteritis Obliterans of Hebrews.) F. P. Weber.—p. 289.
40 *Four Carbon Atom Acids of Diabetic Urine. W. H. Hurtley, —p. 301.
41 Case of Diffuse Fibromyoma of Esophagus, Causing Dysphagia and Death. A. J. Hall.—p. 409.
42 Trench Fever and Its Allies. W. P. Herringham.—p. 429.
43 Cases of Cerebrospinal Fever Treated at Isolation Camp Casualty Clearing Station. A. Presslie and W. E. Lindsay.—p. 437.
44 Trench Fever. G. H. Hunt and J. W. McNee.—p. 442.

37. **Penetrating Wounds of Lung and Pleura.**—Rudolf emphasizes the fact that penetrating wounds of the chest are by no means always fatal, and apparently hopeless wounds, judging from their anatomic positions in the chest, may give rise not only to no danger symptoms but almost to no discomfort. A man may be shot through the chest and scarcely know it at the time nor have symptoms or signs afterward. On the other hand, what may appear to be almost a safe

wound, anatomically considered, may quickly end in death. The wound of entrance may not be in the chest at all and yet terrible and even fatal injury to the chest supervene. Pneumothorax is common after penetrating wounds of the chest. Usually, but not always, there is blood as well as air in the pleura, and very commonly, but not always, infection of the pleura follows. The pneumothorax usually happens at the time of the injury, but may occur days after it. If the air enters the pleura from the external wound, infection with pus-forming organisms is much more apt to occur than if the wound which admits the air is in the lung. As a rule the axiom holds good that the sudden occurrence of pneumothorax is accompanied by severe dyspnea, but there are exceptions to this. As regards the physical signs of pneumothorax, the textbook descriptions mostly hold good, but the coin sound (bell sound) is very elusive. In many cases it is not present at all, although the diagnosis of pneumothorax is confirmed by the Roentgen ray. In others it comes and goes.

The percussion note is usually hyperresonant, but may be almost dull, in cases in which the air is under pressure. The breath sounds are always very distant and vesicular, with one exception; that is, in cases in which there is a large opening into the collapsed lung. Here the type of breathing may be most characteristically amphoric and often very loud. The vocal fremitus and resonance are usually present to about the normal extent, and the latter may have a resonating tone which is very special in character. Tinkling râles are sometimes heard, of a peculiarly musical character. Hippocratic succussion can easily be elicited where fluid also is present, but as a rule the patients are too ill to permit of the shaking. In most cases of pneumothorax, in cases in which the air has come from the lung and infection is absent or not severe, the air is absorbed with a rapidity that greatly varies. In those instances in which the air has come through the chest wall, and especially where the opening remains, infection is nearly always a sequence and the case becomes one of pyopneumothorax, and the only hope is free drainage.

In hemothorax the bleeding here usually is from the lung, but may be from a vessel in the parietes. The greatest danger that threatens these cases is acute infection of the blood in the pleura. The infection may be received from the lung, from the skin surface, or from foreign body carried in with the missile. The physical signs of hemothorax are, generally speaking, those of fluid in the pleura. As regards the treatment of sterile or mildly infected cases of hemothorax, if the amount of blood be small, say not reaching above the angle of the scapula, and there be few or no symptoms of infection, the case may well be left to nature. In cases in which the bleeding has been greater than this and there is displacement of the heart, then something more than expectant treatment seems to be called for. When the lung is traversed by pieces of shell or shrapnel the laceration is very extensive, far more than would be expected from the size of the foreign body. In many cases the missile carries in with it pieces of clothing, which are found at operation, or very likely at postmortem examination. Sepsis being now almost certainly present, these cases usually do badly and their only hope is free drainage.

40. **Four Carbon Atom Acids of Diabetic Urine.**—To determine the sugar, nitrogen, aceto-acetic acid, oxybutyric acid and ammonia in a few cases, Hurtley says, is not sufficient. All these determinations should be made, and the blood and alveolar carbon dioxid, the bases and the acids of the urine, the nitrogen and fat of the feces, should be determined as well in many cases. Not only so, the diet should be analyzed with the view of determining the amount of bases and of acid producing substances it contains, and, what is equally important, the nature of the protein which is being given to the patient.

Archives de Médecine des Enfants, Paris

July, XIX, No. 7, pp. 337-392

45 *Present Status of Knowledge Concerning Meningitis. (Points de vue dans l'étude générale des méningites.) E. Suñer (Valladolid).—p. 337.
46 Paroxysmal Hemoglobinuria from Chilling. (Etude sur l'hémoglobinurie paroxystique à frigore.) E. Gorter and A. A. Huinink.—p. 363.
47 Pseudo-Tetanus. (Le pseudo-tetanus d'Escherich envisagé comme entité nosologique). A. A. Santos Moreira.—p. 368.
48 Infectious Origin of Duodenal Ulcer. J. Comby.—p. 375.

August, No. 8, pp. 393-448

49 *Acute Accidents and Syndromes from Disease of the Brain, Meninges and Spinal Cord. (Accidents et syndromes aigus méningo-encéphalo-médullaires.) L. Guinon and Pouzin.—p. 393.
50 *Prophylaxis of Tuberculous Meningitis and of Miliary Tuberculosis in Children. L. Jeanneret (Lausanne).—p. 414.
51 Three New Cases of Infantile Scorbutus. J. Comby.—p. 422.
52 "Pseudotetanus" Merely One Form of Tetanus. (Un nouveau, cas de pseudotétanus.) E. Gorter (Leyden).—p. 426.
53 *Precocious Maturity in Girls. J. Comby.—p. 428.

45. **Study of Meningitis from Different Standpoints.**—Suñer discusses meningism, serous meningitis and tuberculous and epidemic meningitis. He cites typical cases in children to illustrate each point he mentions to emphasize the differentiating features. He has found that serous meningitis may come on suddenly, with convulsions and prove fatal in a few hours, or chronic hydrocephalus may be its only manifestation for a long time. There is no certain sign of tuberculous meningitis except discovery of tubercle bacilli in the spinal fluid, and this is a difficult matter as they are always scanty. It may be necessary to examine the precipitate thrown down, cold, by the end of twenty-four hours, spreading it carefully on a slide. Negative findings do not exclude it, and he is convinced that errors are often made in its diagnosis. The skin reaction to tuberculin cannot be relied on, he says, as this is usually negative in this type of tuberculosis. Some of the "cured" cases thus labeled were probably cases of infantile paralysis. Epidemic meningitis often appears in attenuated and atypical guise, especially in infants. Mere clinical examination is not sufficient to exclude other causes for convulsions. The spinal fluid may exceptionally be limpid through the entire course of the disease, notwithstanding that meningococci may be numerous. He has found leukocytosis the rule, with from 60 to 80 per cent. polynuclears. The precipitin reaction, agglutination, fixation of complement, and bacteriologic search for the meningococcus help to clear up all doubt. With negative findings, cultures should be started. Inoculation of rabbits in the subarachnoid spaces always proved negative in his experience. In examining a patient it is necessary to exclude meningeal inflammation secondary to disease in the eye, nose, maxillary and frontal sinuses, lungs, or digestive apparatus. Hypostatic pneumonia frequently accompanies epidemic meningitis, and is liable to prove misleading as in the case of a boy of 6 who developed fever and prostration forty-eight hours after a fall from a toy wagon. No sign of fracture could be found but there was impaired resonance over the base of both lungs and no distinct meningitic symptoms. Lumbar puncture the fifth day revealed meningococci.

The prognosis depends in large measure on the character of the epidemic, statistics showing wide variations, and the mortality is high even with serotherapy. Patients still die under it, although the spinal fluid usually clears up and the clinical picture shows improvement for a time after introduction of the serum. In the cases with favorable outcome under serotherapy, Suñer was never convinced that this had been the unmistakable result of the specific action of the serum. The lavage of the subarachnoid space attracts active polynuclears to the spot, and this alone may explain the benefit, without assuming a specific action from the serum. Physiologic salt solution might answer as well.

Suñer says in conclusion that those who advocate injecting the antiserum directly into the ventricles fail to mention the dangers of such a procedure. He describes a case in which symptoms apparently called for it as a last resort. Necropsy showed that the needle had entered the lateral ventricle properly but there was no fluid in either ventricle. It had accumulated around the bulb and below the cerebellum and contained meningococci. The child of 4 collapsed and stopped breathing after 18 c.c. of the tepid antiserum had been injected very slowly into the ventricle. Twenty minutes elapsed before respiration and pulsation were restored and rhythmic traction of the tongue had to be kept up for another hour before the child was breathing regularly. She was unconscious for hours afterward and died five days

later after alternating periods of improvement and aggravation.

49. **Curable Acute Brain, Meninges and Spinal Cord Trouble in Children.**—Guinon and Pouzin report sixteen cases of acute brain and nervous troubles developing in children most of which they are unable to classify with the ordinary syndromes. With a meningitis, even with malformed cells and lymphocytosis, if we cannot find the tubercle bacillus we are justified in reserving the prognosis in the hope of a spontaneous recovery. Such have been comparatively numerous in the Paris hospitals recently. In two of the cases reported, after a brief febrile period, with nightmares, complete incoordination developed, lasting for a week or two, with final recovery. The children could move their legs while reclining but collapsed on the floor when stood up on their feet. Infantile paralysis in an atypical form was evidently responsible for some of the other cases. The children were left with slight sequels. During the fall of 1914 Guinon knew of over fifty cases of infantile paralysis, and reports here a few cases in older children that terminated in recovery. The acute amicrobian meningitis with mononuclear reaction subsided, leaving scarcely a trace, although the children had tuberculous glands. In all the cases cited lumbar puncture was applied repeatedly, and mercurial treatment was given when there was suspicion of inherited syphilis. In the last case described an injection of antimeningococcus serum seemed to aggravate the condition. The diagnosis had been advanced tuberculous meningitis in a girl of 11. The high fever was combated with wet packs, and after a period of delirium, alternating with prostration, convalescence set in. Three weeks after defervescence the child developed fever and total inability to move the legs, any effort to do so causing severe pain. This lasted only two days, and then all the symptoms disappeared. Except for impetigo on head and neck, the child seemed quite normal two weeks later.

50. **Prophylaxis of Tuberculous Meningitis.**—Jeanneret insists on the necessity for impressing on every pregnant woman where there is a case of "open" tuberculosis in the immediate family that the coming child must be separated at once and kept entirely away from contact with the tuberculous parent or other relative. Any furtive kiss or brief visit compromises the success of the sacrifice. As soon as the child has passed the period when generalization of tuberculous infection is most menacing, that is, when it reaches its eighteenth or twentieth month, it can be restored to the family. The risk for the child is comparatively small by that time. As it is a question of life or death for the infant, the transient separation can generally be arranged when the parents have the matter presented to them in the right light. Jeanneret thinks that the ideal is to organize an institution where the newborn children of indigent parents could be segregated from contact with the tuberculous. The relatives could visit the baby regularly and inspect its progress through a glass partition. Switzerland has already several such asylums for the newly born, and he regards them as an indispensable adjunct to the antituberculosis dispensaries. A number of typical cases are cited showing the necessity for removing the newborn at once and the evil that results when this is neglected or delayed.

In case the nursling is already infected, we must act quickly and act vigorously, and his reliance is on tuberculin. He gives it by the Mantoux technic, intradermally. This imitates Nature's processes by the localization; it creates in the child's skin an artificial focus, corresponding to a spontaneous focus without living bacilli, from which the tuberculin is gradually absorbed and gets into the general circulation, and thus stimulates the production of the specific reactions of defense. This artificial focus is maintained by repeated injections of tuberculin, and in his experience it seems to have been fully as potent as a bone or gland lesion in protecting against generalization of the infection. Intradermal injections are simple and easy. The skin is pinched up into a fold, and the very fine needle is introduced, parallel to the surface. He injects 0.01 c.c. of a 1:1,000 solution, repeating the injection every third day and increasing the strength very gradually till 0.1 c.c. of a 1:10 solution is reached in time. The local reaction is less in infants than in older children. A febrile reaction is common, but brief. As the child grows older, it manufactures its own tuberculin in its tuberculous glands, and does not need artificial tuberculinization. Jeanneret is confident that he has saved certain infants by these prompt measures, and does not hesitate to recommend them even when the prognosis is quite grave.

53. **Precocious Maturity in Girls.**—Comby reviews what has been written recently on this subject, especially F. Beekman's study of the question last year.

Bulletin de l'Académie de Médecine, Paris

August 1, LXXVI, No. 31, pp. 89-106

54 *Serotherapy of Typhus. (Résultats de la sérothérapie dans le traitement du typhus exanthématique.) C. Nicolle and L. Blaizot.—p. 95.

55 Typhoid Agglutinins in the Cerebrospinal Fluid. (Transsudation des agglutinines typhiques dans le liquide céphalo-rachidien de l'homme.) F. G. Daumezon.—p. 101.

56 *Kidney Functioning in Soldiers on Active Service. (Le fonctionnement rénal chez les troupes en campagne et ses rapports avec les néphrites de guerre.) P. Ameuille and J. W. MacLeod.—p. 103.

54. **Serotherapy of Typhus.**—Nicolle and Blaizot inoculated every three or four days horses and asses with an emulsion of organs from guinea-pigs conserving the virus of typhus. They selected the most virulent and the least toxic of all the organs, namely, the suprarenals and the spleen. They report here the results in thirty-eight cases of typhus fever treated with the antiserum derived from an ass or a horse that had been inoculated, respectively, 132 and 98 times with this emulsion. There was only one death among the thirty-eight patients and an intercurrent affection during convalescence from the typhus was responsible for this fatality. In 20 per cent. of the cases the disease seemed to be aborted, and, in all, the usual delirium, stupor and prostration failed to develop or else rapidly retrogressed. The other nervous symptoms subsided also and the general condition materially improved. According to recent writers, typhus runs a two weeks' course, but under serotherapy defervescence occurred from the sixth to the twelfth day in a number, and the average for all was 11.61 days. There were no complications in any case. The dosage ranged from 10 to 20 c.c. a day, by subcutaneous injections.

56. **Kidney Functioning in Soldiers on Active Service.**—Ameuille and MacLeod were much impressed with the frequency of spontaneous acute nephritis among the soldiers in the trenches. To investigate the causes of this susceptibility of the kidneys, they have examined the urine from those still apparently healthy. They found albuminuria in 1.87 per cent. of 1,175 infantry soldiers in an active sector, and 1.31 per cent. in 686 in a sector quiet at the time. Among 2,229 British troops from two to eight days after serving their turn in the trenches there were 4.73 per cent. unmistakable cases of albuminuria, and 3.53 per cent. among 311 still in the trenches. Fully 2.91 per cent. of 2,069 English male hospital attendants presented albuminuria, and 10.12 per cent. of 553 new recruits after six months of military training in England. Among 231 attendants at the French base hospitals less than 1 per cent. had albuminuria and these were old chronic cases of nephritis. Reexamination a week or so later showed that in men under 30 the albuminuria was transient, subsiding as the men rested. In the older men it seemed to be a warning of impending or already installed nephritis. Tests of the blood pressure did not reveal any tendency to a pathologic influence on arterial tension from trench life. The urine collected from ten men in the French trenches averaged 1,200 c.c. with 12.35 gm. urea and 9.41 gm. chlorids. Parallel examination of the urine from fifteen men in the English trenches showed a daily average of 1,830 c.c. with 45 gm. urea and 10.34 gm. chlorids. Control examination of soldiers not in the trenches showed the same high figures for the British in comparison to the French, one English soldier excreting 73.4 gm. urea in the twenty-four hours, and all averaging 50 per cent. above the French soldiers.

Journal de Médecine de Bordeaux

August, LXXXVII, No. 10, pp. 189-208

57 *Differentiation of Strangulated Diaphragmatic Hernia. J. Vitrac. —p. 189.
58 Strophanthus in Therapeutics. Indications and Contraindications. (Strophantus et strophantine.) H. Mallié.—p. 192.
59 The Action of the Interossei Muscles. L. Massé.—p. 198.

57. **Diaphragmatic Hernia.**—Vitrac relates an instructive case of ileus which was retrospectively explained as the result of strangulation of the bowel in a diaphragmatic hernia. Necropsy showed that "part of the large intestine was the old and habitual guest of the hernia while a loop of small intestine may have been an occasional guest." Nothing was known of the anomaly, the robust young man complaining merely occasionally of colic in the stomach region. Finally a second loop of small intestine found its way into the hernia, and strangulation ensued. The pain and tenderness in the epigastrium were relieved only when the man sat up and bent forward. The abdomen was moderately distended, with relative indolence to palpation. There was no vesicular murmur on the left side, but the resonance was not much modified, the incarcerated loops of intestines responding with a tympanic resonance in this case although, depending on the contents of the bowel, the findings in such a case might vary to complete dulness. It is necessary to open the chest to get at the hernia from above, as a rule; it is impossible to suture it through a laparotomy opening. The lung might be drawn down to reenforce the suture. In conclusion Vitrac exclaims that the surgeon is not a miracle worker; his success with strangulated hernia depends on the internist's calling him in time. In the case described five days had elapsed after strangulation had occurred before the laparotomy, and the strangulation then was ascribed to constricting bands, the hernia not being discovered until after death. The condition was so grave at the time that exploration was restricted to the minimum and the diaphragm was not palpated.

Lyon Médical

August, CXXV, No. 8, pp. 309-368

60 *The Iodin Reaction in the Urine. Its Importance for the Prognosis of Tuberculosis and in Diagnosis of Typhoid Fever. (Sur une nouvelle réaction urinaire.) M. Petzetakis.—p. 309.

60. **The Iodin Reaction in the Urine as Sign of Typhoid and as Grave Omen in Tuberculosis.**—Petzetakis reports after a year's test of this reaction that it does not occur in normal conditions. He says that it is negative likewise in "closed" pulmonary tuberculosis, but positive findings are encountered in "open" tuberculosis tending to a fatal outcome. It is also constant in typhoid fever. Here it becomes positive so early that it aids in differential diagnosis of the disease. Like other biochemical reactions, it is sometimes positive in other pathologic states, accompanied by high temperatures, but not in a way to detract from its semeiologic value in tuberculosis and typhoid. The technic is simplicity itself, merely the addition of two or three drops of a 5 per cent. alcoholic solution of iodin or of the aqueous solution, made with 1 gm. metallic iodin and 2 gm. potassium iodid to 300 gm. distilled water. The drops are dropped from a dropper on the surface of the urine, about 15 or 20 c.c. in a test tube. After waiting a little while, the walls of the test tube are given a few shakes in such a way that the iodin solution mixes with the urine to form a column of about 2 cm. After waiting a while, the upper layer of the urine in the test tube, thus mixed with the iodin, is compared with the lower layer of the urine in the tube or with urine in another tube. The reaction is positive when the upper layer shows a change of tint to a golden yellow. It is negative if the urine shows no change. Or, 5 c.c. of urine can be placed in each of two test tubes and three or four drops of the alcoholic solution be added to one, and the tint then compared. When the reaction is positive the urine retains the new tint for one, six, twelve or even more hours; this persistence of the color reaction is characteristic. The tint may even become more pronounced after the first few hours. The reaction is not modified by the presence of sugar, acetone, albumin or other pathologic elements, nor by heat, ether, benzine, chloroform or toluol, but addition of lead acetate to the urine prevents the reaction from taking place. The research on this iodin reaction was done in Greece and at Lyons, France, during the last year.

Paris Médical

August 12, VI, No. 33, pp. 133-148

61 *Prophylaxis of Contagious Disease from and to Soldiers on Furlough. (Hygiene du soldat permissionnaire à Paris.) Borne. —p. 133.
62 *Drip Drainage of Bladder after Operations on the Kidney. (Drainage au goutte à goutte urétero-vésico-urétral dans les néphrotomies et pyelotomies.) M. Devroye.—p. 136.
63 *Epidemic Meningitis. G. Rosenthal.—p. 140.
64 *Thread Drainage of Suppurating Arthritis. (Nouveau mode de drainage des plaies articulaires de guerre et des arthrites purulentes communes du membre supérieur.) H. Chaput.—p. 143.
65 The High Cost of Living. (Le prix de la vie.) M. Labbé.—p. 145.

61. **Hygiene of Soldiers on Furlough.**—Borne relates that one of the unprecedented features of the great war now is that soldiers are constantly coming and going across the country; the wounded are sent back to the home zone to convalesce, and others journey to take their places in the ranks, while the men are given frequent one-day and six-day leave of absence to enable them to visit their families. There is a constant network of passing and repassing men, and the danger of their spreading infection is great, bringing home germs and infested vermin from the war zone and carrying back with them disease contracted at their homes or on the way. This raises a host of new problems and he discusses how they can best be solved.

62. **Drip Drainage After Nephrotomy.**—After cutting off the tip of a No. 12 or No. 14 Nélaton catheter, Devroye introduces it through a longitudinal incision in the kidney pelvis, fastening it so the lower end is suspended in the funnel formed by the entrance to the ureter. The catheter is connected above with a drip irrigator ensuring a flow of some suitable antiseptic. He has found a fivefold dilution of Dakin's solution effectual in severe cases of infection of the kidney pelvis, but a 1:10,000 solution of potassium permanganate is generally sufficiently active. By this simple method of drip irrigation of the kidney proper or of the pelvis, the infection is combated, the region is drained by the natural routes, the ureter is dilated by the accumulating fluid so that the danger of stricture after removal of a concretion is reduced, and there is no chance for ascending infection. But the chief advantage of the method is that the wound heals without production of a fistula. He gives illustrations of the technic with both pyelotomy and nephrotomy, and reports three cases showing the prompt and complete healing in from one to three weeks after an operation for pyonephrosis, a calculus in the kidney pelvis, or uronephrosis. To control the draining, he colors the disinfecting fluid with a little methylene blue.

63. **Epidemic Meningitis.**—Rosenthal found that certain strains of meningococci took the gram stain in some recent cases of meningitis. He also calls attention anew to the way in which meningococci set up a typical focus of inflammation in the adenoid tissue of the throat. (See abstract 49 in THE JOURNAL, 1916, lxvii, 473.) He reiterates further that few as yet realize how the pathology of the rhinopharynx dominates that of the entire respiratory passages. Examination of the nasal sinuses is an indispensable part of every examination of the lungs, and it is folly to separate into special fields the nose and lungs, when they represent merely different stages of disease of the air passages.

64. **Drainage of Wounded Joints.**—Chaput applies the principle of thread drainage in treatment of badly shattered large joints, and here gives the technic for this "draining resection" in detail for the shoulder, elbow and wrist.

Presse Médicale, Paris

August 5, XXIV, No. 43, pp. 337-344

66 *Ionization Treatment of Adherent Cicatrix with or without Contracture. M. Chiray and G. Bourguignon.—p. 337.
67 *Glycuronuria and Its Variations. P. Gautier.—p. 339.

August 7, No. 44, pp. 345-352

68 *Methods of Amputation Considered from Point of View of Fitting Artificial Limb. A. Depage.—p. 345.

69 Devices to Overcome Radial and Popliteal Paralysis. (Appareils de suppléance dans les paralysies du radial et du sciatique poplité externe.) J. Privat and J. Belot.—p. 349.

August 10, No. 45, pp. 353-360

70 Treatment of Suppurating War Wounds of the Elbow. (Traitement des arthrites suppurées du coude par plaie de guerre.) L. Bérard.—p. 353.

71 *Soldier's Heart. (Le rythme cardiaque chez le soldat combattant.) L. Binet.—p. 356.

66. **Ionic Medication in Treatment of Deforming Scars.**—Chiray drives potassium iodid directly into the cicatricial tissue by means of the negative electrode of a constant current, and reports surprisingly fine effects on the vicious cicatrix itself and on the resulting contractures. As the cicatrix softens and separates from the adjacent tissues, the underlying tissues, nerves, etc., have approximately normal conditions restored. The mechanical and physiologic relief thus afforded permits mobilization and the cure of contracture of the hysteric and reflex types.

67. **Glycuronuria as Index of Liver Functioning.**—Gautier's experience confirms that of Roger, Chiray and others in regard to the importance of the glycuronic acid content of the urine as a sign that the liver is doing its work properly. In 100 healthy persons examined, the glycuronic acid content was pronounced, and a dose of camphor was followed by little if any increase in the glycuronuria on an average diet. The fasting healthy subject showed a slight increase after the camphor test. In cases of heart or kidney disease with insufficiency of the liver there was always a notable transient elimination of glycuronic acid after ingestion of the test dose of camphor. In fifteen diabetics the camphor test always proved negative. In advanced cirrhosis the liver is unable to respond to the camphor test. Roger believes that the glycuronic acid is manufactured by the liver to combine with certain toxic bodies in the organism and thus eliminate them. This assumption is confirmed by a recent case of attempted suicide with a preparation of phenol. The urine was black and showed the highest proportion of glycuronic acid Gautier has ever encountered. Then followed a phase in which there was no glycuronuria, after which normal conditions were gradually restored. With cirrhosis of the liver, the total absence of glycuronuria is a sign of a speedily fatal outcome. In tests of alimentary glycosuria, the glycuronuria was not modified even by ingestion of 150 gm. sugar, confirming the view that the glycuronic acid is produced only when needed to take care of toxic substances and get them eliminated. The Grimbert and Bernier test for glycuronic acid is reliable if the reagents are pure. (See abstract 57 in THE JOURNAL, 1916, lxvii, 80.)

68. **Stumps and Artificial Limbs.**—Depage has been consulting with manufacturers of artificial limbs, studying how in amputating to provide the best conditions for the fitting of an artificial limb. He pays high tribute to American-made artificial limbs which, he says, are now being adopted by the majority of surgeons in the present war. He describes the preferable technic for amputating at the various segments of the leg or arm, with illustrations, showing in particular what not to do.

71. **Soldier's Heart.**—Binet's study of the heart rhythm in soldiers in the trenches and on long marches has confirmed the possibility of bradycardia from fatigue, and of changes in the pulse under emotional influences, the dropping of shells, etc. A tachycardia may result which may persist indefinitely, or it may recur in paroxysms. A tendency to bradycardia may accompany wounds of the skull, while tachycardia prevails with wounds of the chest, unless the heart is affected, in which case the tendency is to progressive bradycardia. There is also a tendency to bradycardia in aviators after sudden descents—part of a vagobulbar syndrome explaining the *mal des aviateurs*.

Revue de Gynécologie et de Chir. Abd., Paris

XVIII, No. 6, pp. 441-611. Last indexed Feb. 5, p. 462.

72 *Interstitial Pregnancy. (La grossesse interstitielle.) C. Waegeli (Geneva).—p. 441. Commenced in No. 5.

73 War Wounds of the Abdomen. (Plaies de l'abdomen par projectiles de guerre.) G. Rouhier.—p. 504.

72. **Interstitial Pregnancy.**—Waegeli has encountered two cases of interstitial pregnancy during the last year at Geneva, and compares them with 150 he has compiled from the literature. In only fifty-two of the whole number were the records complete, specifying the Ruge-Simon sign—the more or less vertical position of the fundus of the uterus, rising from the sound cornu to the gravid cornu; the insertion of the round ligament laterally from the fetal sac, and, lastly, the asymmetrical position of the uterine adnexa in relation to the uterus. He illustrates and describes in minute detail the findings in his cases, and insists on the necessity for an immediate laparotomy as soon as the diagnosis of interstitial pregnancy is certain. Some women have recovered after conservative operations but he thinks the cornu should be resected, unless excessive hemorrhage compels supravaginal amputation.

Policlinico, Rome

August 6, XXIII, No. 32, pp. 967-994

74 Fish Poisoning from Fish Put Up in Oil. (Tonno sott' olio non commestibile. Tossicita per gli animali da esperimento e stato microbico.) M. Pergola.—p. 967.

75 Parauretkral Nodules and Passages of Gonorrheal Origin. (Sopra le forme blenorragiche di canali parauretrali. Nodi parauretrali.) G. C. Sanfilippo.—p. 979.

Riforma Medica, Naples

XXXII, No. 22, pp. 585-612

76 Self-Inflicted Emphysema-Edema of the Face in Malingering Soldiers. P. D. Siccardi.—p. 590.

No. 23, pp. 613-640

77 Clinical, Anatomic and Bacteriologic Study of Cholera, Especially Cholera Nephritis. P. Guizzetti.—p. 613. Commenced in No. 22.

78 Simple Apparatus for Extension and Immobilization of Fractured Limb. B. Schiassi.—p. 621.

No. 24, pp. 641-668

79 Unusual Types of Paratyphoid Bacilli Isolated from Soldiers in the War Zone. A. Azzi.—p. 645.

80 Frequency of Paratyphoid and Multiplicity of Bacterial Types Producing It. G. Galeotti.—p. 647.

81 To Limit Mutilations. (Per limitare le mutilazioni.) G. Perez.—p. 649.

82 Another Case of Helminthiasis from Dipylidium Caninum in Man. A. Ancona.—p. 652.

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83 The Immunity Process. (Nuevas consideraciones sobre el proceso de la immunidad.) J. Howard.—p. 519.

84 Importance for the Public Health of Sanitary Guard, the "Hygiene Experts." (Los guardas sanitorios o peritos higienistas.) F. Otero.—p. 529.

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85 Spontaneous Expulsion of Long Loop of Intestine through Perforation in Uterus Caused by Criminal Abortion. Recovery. J. B. Gonzalez.—p. 683.

86 Intravenous Iodid and Salicylic Medication. A. A. da Matta.—p. 691.

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87 Sudden Blindness from Hematemesis and Melena. F. Belgeri and J. C. Labat.—p. 709.

88 Diagnosis of Twin Pregnancy. (Embarazo gemelar.) T. A. Chamorro.—p. 712.

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89 Hematology in Obstetrics. T. A. Chamorro.—p. 1.

90 Sale of a Medical Practice. (Venta de la clientela medica.) A. Stucchi.—p. 9.

Finska Läkaresällskapets Handlingar, Helsingfors

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91 *The Clinical Course of Gonorrhea in Women. Treatment and State Control. (Studier öfver det kliniska förloppet af gonorré hos kvinnan med sarskild hänsyn till behandlingen jämte ett bidrag till bilysandet af statskontrollens betydelse, grundadt på jämförande undersökningar af den veneriska morbiditeten i Kopenhamm, Kristiania, Stockholm och Helsingfors.) M. af Heurlin.—p. 1. Concluded in No. 2.

92 Physiologic and Chemical Tests of Domestic and German Digitalis Leaves. J. Gronberg.—p. 106.

93 Fifteen Years' Work at the Helsingfors Children's Hospital. W. Pipping.—p. 124.

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94 Operative Treatment of Gallstones. (Bidrag till gallstensjukdomens operative behandling.) H. v. Bonsdorff.—p. 241.

95 Pasteboard Splints for the Arm. (Om pappskenor för de öfre extremiteterna.) R. Faltin.—p. 369.

No. 3, pp. 467-528

96 Anatomy of the Eye. Historical Sketch. (Grunddragen af ogonanatomiens historiska utveckling.) V. Gronholm.—p. 467.
97 *Radium Treatment of Uterine Cancer. (Erfarenheter af radiumbehandling vid lifmoderkräfta.) O. A. Boije.—p. 485.
98 *Tuberculosis Mortality in Finnish City. (Om dödlighteten till följd af tuberkulösa sjukdomar i Vasa under åren 1895-1915.) K. Ekholm.—p. 507.
99 *Local Anesthesia for Reduction of Luxations. T. Kalima.—p. 526.

No. 4, pp. 589-718

100 *Stab Wounds of the Heart. (Några fall af penetrerande hjärtsår.) B. Runeberg.—p. 589.
101 Action of Chloroform and Ether on the Circulation in Rabbits. (Om kloroformens och eterns verkningar pa blodcirkulationen hos kaninen.) Y. Airila.—p. 609.
102 Abducent Paralysis from Otitis Media. T. Eklund.—p. 632.
103 Agonal Bacteriemia. C. Nyberg.—p. 647.

91. **Gonorrhea in Women.**—This extensive study of the clinical course and treatment of gonorrhea in women is completed by a statistical review of the comparative morbidity from venereal diseases in the capitals of the four Northland countries, with special regard to the influence of state control of prostitution. The article is based on 446 cases of gonorrhea, including 412 women and thirty-four little girls, given treatment at the Helsingfors hospital. Af Heurlin also tabulates statistics from eleven leading clinics, the total embracing 4,342 cases. The figures from seven clinics, with 2,178 cases, show involvement of the rectum in 27 per cent. The course of rectal gonorrheal trouble is extremely chronic and insidious. The younger the patient, the more protracted the course of gonorrhea. In Berger's report of 127 cases in girls from 5 weeks to 10 years old, the gonorrheal vulvovaginitis dragged along for three months in 61.5 per cent., for four and a half months in 32.4 per cent. while in about 2 per cent. the affection persisted at the end of ninety-four days. Cervicitis was apparently healed in an average of 53.9 days, and urethritis in 36.8, while the urogenital lesions healed in forty-three days, that is, the secretions were free from gonococci in from three to five separate examinations. The rectum is involved in fully 50 per cent. of all the cases of gonorrheal vulvovaginitis in little girls. There was metastasis in the joints in 1.4 per cent. of af Heurlin's 412 cases of gonorrhea in women, but Chiari's compilation of 2,309 cases showed arthritis in 3 per cent. The tubes and ovaries became involved in about 20 per cent. of af Heurlin's 412 cases in women. None of the data presented indicate that the adnexa are more liable to become involved with active cases with expectant treatment of gonorrheal cervicitis, when the patient is kept in repose or allowed to be up only a part of the day during the course of treatment. Internal measures never seemed to shorten the course of the disease. It ran on an average a six months' course in women, and in a few it persisted for a year or two. No direct influence on the disappearance of the gonococci could be detected under vaccine therapy. The reaction is not specific and the provocative action in the later periods is uncertain.

The venereal morbidity in the four cities reported on fails to show that state control is effectual as a means of combating endemic venereal morbidity. Its effect is shown most in that the statistics thus obtained show a higher gonorrhea morbidity in women. An extensive bibliography reviewing conditions in various countries is discussed, the comprehensive article filling 198 pages, with fifty-two tables of comparative statistics and nineteen charts. One table gives Stockmann's findings on reexamination later of 582 cases. He found gonococci months after the women had been dismissed as cured in 46.2 per cent. The maximum duration was two years.

97. **Radium Treatment of Uterine Cancer.**—In Boije's thirty-five cases the growth was inoperable and a clinical cure was realized under radium in seven of the women. There has been no sign of recurrence during the six to twelve months since. In two other cases the cancer returned after a year of apparent health. Radical removal of the growth became possible in two cases as it retrogressed under the radiotherapy.

98. **Tuberculosis in City in Finland.**—Ekholm found the tuberculosis mortality at Vasa 4.215 per thousand inhabitants per year during the last twenty years. The proportion was 7.57 per thousand among the children under 5, and 4.42 per thousand between 16 and 30. The tuberculosis mortality for women was only 3.91 per thousand while it was 4.69 for men. The tuberculosis mortality has declined somewhat for the well-to-do but not in working class circles.

99. **Local Anesthesia for Reduction of Luxations.**—Kalima has tried to reduce dislocation of the humerus under local anesthesia in eleven cases and of four other bones in one case each. In three cases it became necessary to resort to general anesthesia after all, but in all others reduction was simple and easy. In fifteen minutes after injecting the novocain, the dislocated extremity could be manipulated without causing the patient the slightest pain. This is particularly an advantage for the rural physician when there is doubt whether the bone is fractured or merely dislocated. The muscles relax under the local anesthesia so that sometimes the bone can be slipped into place without reduction maneuvers. Kalima cites similar experiences published by others. In two cases the femur was dislocated through the sciatic foramen, in two through the obturator, including his personal case. In all the luxation was reduced with ease. The anesthetic must be injected at a point where the skin is intact, using from 10 to 40 c.c. of a 1 per cent. solution of novocain, or, in case of the femur, up to 50 or 70 c.c. He has previously published his excellent results with local anesthesia in reduction of fractures.

100. **Stab Wounds of the Heart.**—Runeberg reports five cases with recovery under operative treatment. The symptoms indicating pressure on the heart may include apathy and somnolence approaching absolute unconsciousness. In other cases symptoms of internal hemorrhage dominate the clinical picture. In operating, he prefers the extrapleural route, cutting an osteoplastic flap to ensure better access. He emphasizes the importance of removing all the blood from the pericardium cavity. He rinsed it clean with warm saline, flushing the deeper recesses through a rubber tube. This reduces to the minimum the danger of pericarditis. He concludes the operation by carefully suturing the opening in the heart and in the pleura. Examination later in a number of cases of stab wounds has shown a surprising tolerance on the part of the heart.

Hospitalstidende, Copenhagen

August 2, LIX, No. 31, pp. 753-776

104 *Fracture of the Sesamoid Bones of the Great Toe. (Frakturerne af Storttaaens Sesamknogler.) T. Eiken.—p. 753.
105 Lupus on the Lips and Mucosa of the Mouth. (Om Forekomsten af Lupus erythematosus paa Læbernes Prolabium og Mundets Slimhinde.) P. Haslund.—p. 760. Commenced in No. 30.

August 9, No. 32, pp. 777-800

106 *Case of Phlegmonous Gastritis. P. V. Tuxen.—p. 777.

104. **Fracture of Sesamoid Bone of Big Toe.**—In reviewing the records of the Copenhagen hospitals for the last fifteen years, Eiken found only one case of this kind, and it was a pseudo fracture, the separation of the bone into halves being evidently congenital. A case of true fracture was recently encountered at Rovsing's private clinic. The roentgenograms of both cases are given. The fractured bone was removed about a year after the accident which occurred while the woman was walking on an asphalt pavement. The symptoms were pain starting at a point at the margin of the tibial sesamoid bone of the great toe, with tenderness and a slight cracking sound on moving the toe. It is impossible to differentiate the fracture from a sprain or contusion, acute gout or rheumatism, without roentgenography. This clears up the diagnosis at once. The foot had been treated for a year with baths, massage, etc., but without relief. A complete cure followed resection of the fractured bone. Eiken knows of only four other cases on record, all in adults. In one case the disturbances subsided under conservative measures; in the others not until part or all of the bone had been removed.

106. **Phlegmonous Gastritis.**—Tuxen relates a case which he says is the third on record in which phlegmonous gastritis was diagnosed before the operation or death. The patient was a previously healthy young man under treatment for

rubeola. He suddenly developed symptoms suggesting acute stomach trouble with pains in the stomach region and incessant vomiting, paresis of the intestines and high temperature. Under the diagnosis of either perforated gastric ulcer or phlegmonous gastritis, the stomach was opened and diffuse phlegmonous gastritis was found. The stomach was drained but death followed in three days. Tuxen discusses this form of gastritis from every standpoint, comparing his case with the 121 J. Jensen compiled from the literature, adding ten personal cases to the list. A phlegmon can retrogress, but as we cannot exclude perforated gastric ulcer in these cases, Tuxen thinks a laparotomy is indicated. When phlegmonous gastritis is discovered, he would refrain from further intervention.

Hygiea, Stockholm

LXXVIII, No. 14, pp. 993-1088

107 Simultaneous Incipient Tabes, Tuberculous Spondylitis, and Transverse Myelitis in Man of Forty-Two. G. Lundahl.—p. 993.
108 Polyneuritis in Young Woman Suggesting Menière's Disease. (Ett fall av polyneuritis cerebralis menieriformis.) H. Key-Aberg.—p. 1009.
109 *The Dangers of Lumbar Puncture. (Om farorna vid lumbalpunktion.) V. Boivie.—p. 1023.

109. **The Dangers of Lumbar Puncture.**—Boivie had a patient with diffuse symptoms of a brain tumor who died suddenly nine hours after an extremely cautious lumbar puncture. Only 3 c.c. of cerebrospinal fluid had escaped, and it dripped a drop at a time. An hour later she screamed with sudden intense pain in the head and then became somnolent and died the ninth hour from failing respiration. Necropsy revealed a glioma 7.5 cm. long by 4.5 cm. wide, starting in the floor of the ventricle, with an offshoot extending into the foramen magnum. The ventricles were not distended, and hence he is convinced that the lumbar puncture could not have been directly responsible for the fatality in this case. There is always the danger, however, that the needle may go too far, especially in children, and puncture the abdominal aorta or a loop of intestine, but he has never heard of this being done. In three cases on record the needle passed through an abscess and carried germs into the spinal cavity. Von Lier suggests on this account to administer hexamethylenamin beforehand. It has also been recommended in case of bleeding. With unruly patients there is danger of breaking the needle. In some recent reviews of the subject a number of instances are related of sudden death before the contemplated lumbar puncture had been applied. A recent compilation by Schönbeck lists seventy-one cases of sudden death after lumbar puncture, but Boivie comments that they are listed without criticism of the actual share of the lumbar puncture in the fatality.

In a recent case in Billström's service, a woman of 40 with incipient tabes dorsalis was treated with lumbar puncture, 5 c.c. of fluid being withdrawn. The woman died suddenly twenty-three hours later and necropsy revealed embolism in the left coronary artery from thrombosis in the aortic valve. The release of the spinal fluid may have induced a hemorrhage *ex vacuo* or in some way interrupted the communication between the fluid in the brain and in the spinal cord. If there is much internal hydrocephalus any abrupt change in the tension of the fluid in the spinal cavity is liable to suck into the foramen magnum any loose tissue in the vicinity. This is manifested by an abrupt change in the tension of the fluid. Hence the manometer findings should be closely watched during lumbar puncture, stopping at the first sign of a sudden drop in the pressure. Exceptional care is necessary with high blood pressure and rigid blood vessels. Psychic irritation and alcoholism contraindicate it entirely. In conclusion, Boivie quotes Schönbeck's warning to keep the patient reclining for twenty-four hours before lumbar puncture, and for from twenty-four to forty-eight hours afterward, with the head low during the first twelve hours. Any change from the reclining position should be made extremely gradually. The fluid should never be aspirated under any circumstances, and no attempt should be made at lumbar puncture on outpatients. The mishaps that have been published can be traced as a rule to the bursting of an aneurysm or arteriosclerotic vessel under too rapid fluctuations of pressure in the spinal canal, or else to part of an intracranial tumor being drawn into some opening thus plugging it.

Ugeskrift for Læger, Copenhagen

July 27, LXXVIII, No. 30, pp. 1251-1290

110 *Familial Chronic Anemia with Jaundice. J. U. Gerdes.—p. 1251.
111 *Occult Bleeding. (Undersøgelser over okkult Blødning.) J. P. Gregersen.—p. 1260. Commenced in No. 29.

August 3, No. 31, pp. 1291-1352

112 Instrument for Mechanical Clockwork Hammer Action for Uniform and Exact Percussion. C. Jørgensen.—p. 1291.
113 Acetonemia with Vomiting in Child of Five. H. Thorborg.—p. 1298.

110. **Familial Hemolytic Jaundice.**—In the family described by Gerdes seven of the ten members have chronic anemia, jaundice, enlargement of the spleen, microcytosis and urobilinuria. The mother is free from it and one of her three daughters and one son. There were also a number of cases in the preceding generation. Iron and arsenic is the main reliance, but no cure is known from them. Splenectomy may be followed by marked improvement. This does not cure the disease, but it removes a constant menace to the blood, the more dangerous as the resisting powers of the corpuscles are so far below par. It would be instructive if we could study the blood systematically in persons who have had the spleen removed, but the number is too small as yet.

111. **Occult Bleeding in Differentiation of Cancer.**—Gregersen here concludes his report of extensive research on occult bleeding. The previous instalments of the article have already been summarized in these columns. He found the benzidin test, as modified by Wagner, by far the most sensitive and reliable technic, and asserts that the findings can be accepted with confidence in differentiation of gastric ulcer and cancer. With cancer, the occult bleeding keeps up continuously, week in and week out, while with gastric ulcer a series of negative findings interrupts occasionally the series of positive responses. We can count on negative findings with chronic gastritis with achylia, colitis, simple dyspepsia and constipation, and gallstone trouble. His findings were constantly negative in 602 tests on 66 patients in these categories. The findings were also constantly negative with heart disease, edema, ascites, nephritis and cirrhosis of the liver, in 200 tests on twenty-five patients. Of the thirty-four patients with gastric ulcer, there was occult hemorrhage in thirty; twenty-six were under observation for a long time and in every case the occult hemorrhage stopped through longer or shorter periods or permanently. The thirteen patients with gastric cancer who were under examination for many months never failed to give a positive response to the benzidin tests for invisible blood in the stools. When the tests give a positive response, in a dubious case, for a few days and then a negative response for a few more days, cancer can be excluded with practical certainty. A number of specially instructive cases are described, among them that of a man of 61 who for four months had presented every sign of malignant disease of the stomach, even to extreme anemia and emaciation. But as the test for occult hemorrhage gave negative findings on five out of eight days of tests, cancer was excluded. The man's prompt recovery under treatment for ulcer confirmed the correctness of the diagnosis. During the five months since he has gained 10.5 kilograms. In another case a child, not quite 2 years old, presented extreme anemia, and invisible blood was found in forty-three tests of the stools while it was absent in four specimens. There were no complaints of pain, and the Weber test was consistently negative. On the basis of the benzidin findings the diagnosis of an ulcer in stomach or duodenum seemed certain. Necropsy confirmed this as it revealed idiopathic dilatation of the esophagus with a peptic ulcer.

Correction.—The articles in the *Semana Medica* of Buenos Aires, Nos. 16 to 18, reviewed in THE JOURNAL, July 15, 1916, p. 244, referred to the Argentine Republic, not to Brazil, as erroneously inferred by the translator. Titles 67, 71 and 74 should read "The Sanitary Condition of Argentina"; "Public Health Matters Throughout Argentina," and "Infant Mortality in Province in Argentina."